

2014-1450

**United States Court of Appeals
For The Federal Circuit**

INTEX RECREATION CORPORATION,
*Plaintiff/Counterclaim-
Defendant/Appellee,*
v.

TEAM WORLDWIDE CORPORATION,
*Defendant/Counterclaim-
Plaintiff/Appellant.*

Appeal from the United States District Court for the District of Columbia
in case no. 1:04-cv-01785-PLF, Judge Paul L. Friedman.

CORRECTED OPENING BRIEF FOR TEAM WORLDWIDE

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August 4, 2014

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CERTIFICATE OF INTEREST

Counsel for the appellant, Team Worldwide Corporation, certifies the following:

1. The full name of every part or amicus represented by me is:

Team Worldwide Corporation

2. The name of the real party in interest represented by me is:

N/A

3. All parent corporations and any publicly held companies that own 10 percent or more of the stock of the party or amicus curiae represented by me are:

N/A

4. The names of all law firms and the partners or associates that appeared for the party or amicus now represented by me in the trial court or agency or are expected to appear in this court are:

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STATEMENT OF RELATED CASES

There are no related cases pending in this Court or any other court that will be affected by this Court's decision in this appeal.

JURISDICTIONAL STATEMENT

The district court had jurisdiction under 28 U.S.C. §§ 1331 and 1338. On March 10, 2014, the district court entered final judgment granting summary judgment of non-infringement which disposed of all parties' claims. [A38-64] Appellant Team Worldwide timely appealed the judgment on April 29, 2014. Appellant thus believes that this Court has jurisdiction over this appeal under 28 U.S.C. § 1295(a).

STATEMENT OF THE ISSUES

1. Whether the district court, in the absence of any lexicography, disclaimer, or disavowal anywhere in the intrinsic record, erred by importing limitations into the claim term “socket”—including by requiring that a socket not only have “an opening or hollow that forms a holder for something,” but also that it “fits and holds onto an inserted part” such that the socket and part are “detachably connected to each other?”

2. Whether the district court improperly found facts in granting summary judgment of no literal infringement, when it found that a pump body that could be detached by simply removing about 10 ordinary screws was not “detachable,” and then looked at structures other than those accused by Team Worldwide to find non-infringement?

3. Whether the district court improperly found facts in granting summary judgment of no doctrine of equivalents infringement by passing over Team Worldwide’s evidence of insubstantial differences, based on an erroneous belief that two claim elements cannot be met by one structure?

STATEMENT OF THE CASE

This is a patent case about inflatable beds in which the body of an air pump is “wholly or partially located in [a] socket” in the beds, rather than hanging off the side like in the prior art. The district court first erred by construing the claims to cover only some embodiments in the specification, under the mistaken belief that the inventor had elected only those embodiments when responding to a restriction requirement at the outset of prosecution. Not only did this analysis misunderstand the reason for the restriction, but it failed to address the fact that when the inventor amended his claims post-restriction, he pointed, as support for the amendments, to the embodiments that the district court believed were previously eliminated from the claims via restriction. The district court’s misunderstandings caused it to err in construing the claim term “socket” to be limited to particular types of “detachable” structures, even though the court recognized that the ordinary meaning of the term is not so narrow, and the court did not find a disclaimer, disavowal, or lexicography that would so limit the term.

When later applying its erroneous construction on summary judgment, the district court erred, second and third, by further narrowing the term so the claims did not cover even embodiments the district court recognized as being “claimed embodiments,” and then resolving fact disputes against Team Worldwide, the non-movant. In particular, the pump bodies in the accused beds are held in place

principally by a socket structure and are further prevented from being pulled out axially by 8 to 11 screws that can be readily removed with a common screwdriver—they are not integral with, welded to, or otherwise permanently attached to the sockets. Yet the district court found facts—*i.e.*, that no reasonable jury could find the pumps detachable given the degree of effort required to remove them, relative to the degree of effort required to unscrew a light bulb or mason jar lid. The district court then extended its errors by finding no doctrine of equivalence infringement, even though there were no estoppels or disclaimers. The district court’s multiple errors led to this appeal.

STATEMENT OF FACTS

I. The ‘469 Patent – An Inflatable Bed With An Air Pump “Wholly or Partially Located in [a] Socket” of the Bed

Team Worldwide’s asserted U.S. patent 6,793,469 [A82-111] is directed to inflatable beds like those a person might use when camping, or for guest bedrooms. Early inflatable beds had connectors at their edge to which separate air pumps could be attached to fill the beds (e.g., by twisting the pumps on and off to open and close a valve on the bed). The ‘469 patent shows such an arrangement in its Figure 1A:

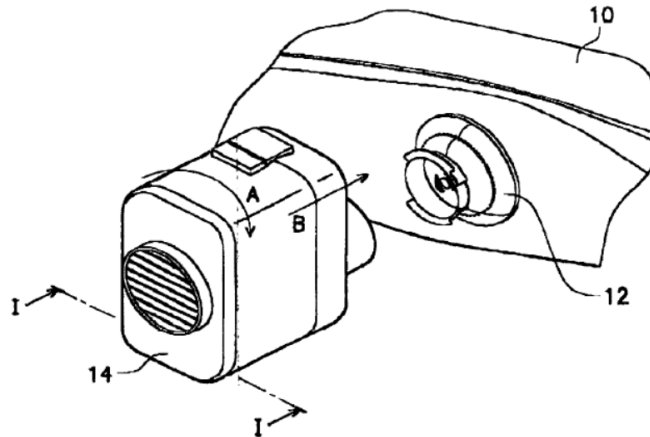
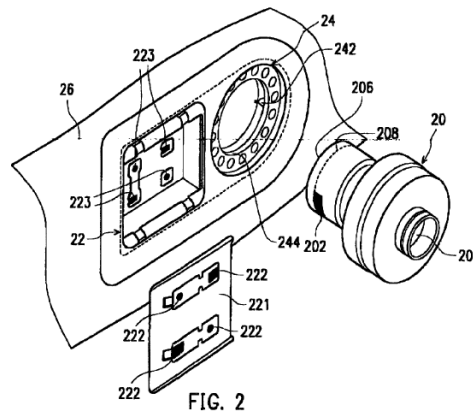


FIG. 1A (PRIOR ART)

[A83] But the pump, when it was connected, could flop around and cause the airflow to be pinched and impeded if a person did not stand nearby and hold the pump.

The '469 patent fixes these problems and creates a compact and integrated system by placing the pump body (the main part of the pump, as contrasted with the air inlet or outlet) *wholly or partially in a socket* built into the inflatable body. The patent specification refers to ten separate embodiments. The First, Eighth, and Tenth embodiments are particularly relevant to the claim construction issues:

FIG. 2
First Embodiment

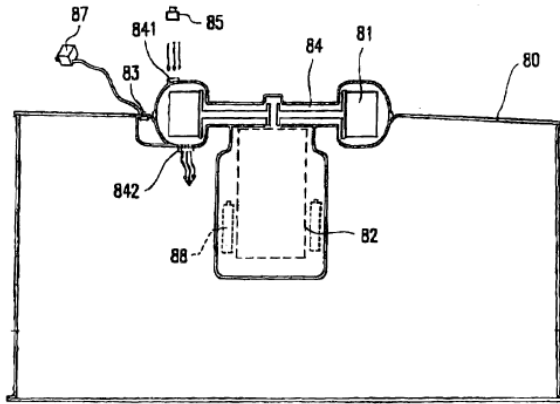


FIG. 13A

Eighth Embodiment

[A84; A104; A107] In the First Embodiment, the pump is slid into socket 24.

When electrode 202 contacts electrode 242 of the socket, electric power flows from battery case 22 to the pump motor. [A108-109 (2:50-3:1)] The pump can be pulled out of the socket, e.g., to deflate the bed. [A109 (3:4-6)] The Eighth and Tenth Embodiments show beds with pumps inside “chambers” (where the Tenth Embodiment has separate deflating and inflating pumps). Holes in housings around the chambers allow air to flow in and out of the beds.¹ The fans and associated motors in the Tenth Embodiment are “permanently or detachably” connected to the bed. [A111 (7:2-3)] The ’469 patent does not describe the Eighth Embodiment as being either permanently or detachably connected to the bed. [A110 (6:26-50)]

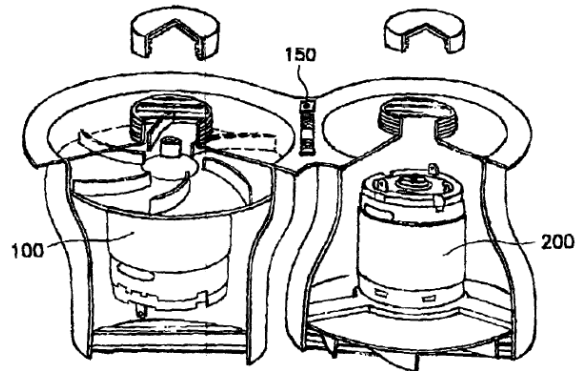


FIG. 15

Tenth Embodiment

¹ The remaining seven embodiments are largely variations on a theme for purposes of the issues here, and were not the focus of the parties below or the district court.

II. The ‘469 Prosecution – Distinguishing the Invention from Pump Bodies that Were Not “Wholly or Partially Within” a Socket of the Inflatable Body

The ‘469 prosecution focused on the positioning of pump bodies both wholly and partially in a socket. Prosecution began with a four-way restriction requirement that the Examiner applied to particular claim groups. Group I was a “method of inflating and deflating an inflatable product”—all the method claims. The Examiner characterized Group II as a device that “inflates and deflates by reversing orientation of the motor.” Group III was a device that “reverses the direction of rotation of the motor” and Group IV was a device that “uses two motors, one for inflation and the other for deflation.” [A364]

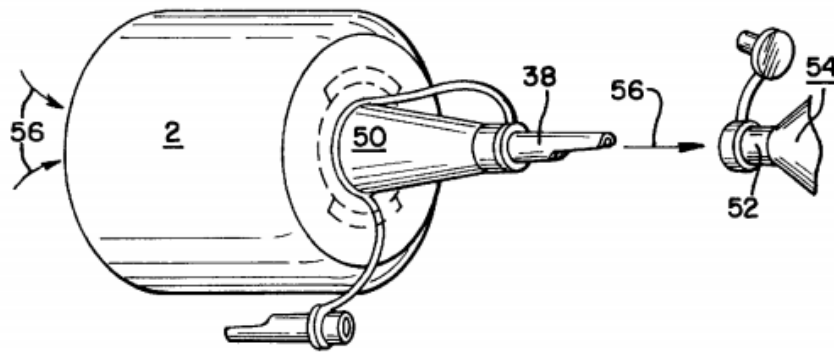
The inventor elected Group II, directed to claims 1-11 and 17-18, and represented by claim 17, which by its plain language addressed all of the embodiments shown above (and which after subsequent amendment issued as asserted claim 14):

17. An inflatable product including:

- an inflatable body;
- a socket built in the inflatable body;
- an electric pump connected to the socket to pump the inflatable body;
- a connector provided on the electric pump for connecting an external power to actuate the electric pump.

[A295]

The Examiner then rejected the elected claims as either anticipated by U.S. Patent 5,890,882 to Feldman, or obvious over Feldman and another reference. The inventor responded by amending the independent claims to recite that the pump includes a “pump body [that] is wholly or partially located in the socket,” and argued that Feldman’s pump body (2) was outside the socket (52), as shown in the following figure from Feldman:



[A406-08] Importantly, the inventor cited, as support for the amendment, the original specification at “page 6, lines 4-20 and page 12, line to page 13, line 2 ..., and in Figs. 6A, 6B, 13A and 13B.” [A408] Figures 13A and 13B depict the embodiment eight discussed above. The inventor’s citation of these passages, including the passage directed to embodiment eight, is important, as explained below, because the district court’s rulings stemmed from its mistaken belief that the earlier election *carved this embodiment out* from the issued claims (in addition to the Ninth and Tenth Embodiments).

The Examiner then initiated a telephone interview to get permission to cancel several claims, followed by a notice of allowance with an Examiner's amendment and interview summary. The inventor felt the distinction of a pump "wholly or partially located in the socket" was important enough that he took the unusual step of filing a separate interview summary to emphasize that distinction over the art. [A430; A439]

After the inventor filed a Request for Continued Examination (RCE) to submit more prior art, the claims ultimately issued without further amendment. Although the Examiner made a new rejection over admitted prior art (see FIG. 1(a) above) and U.S. Patent 5,503,618 to Rey, the inventor explained that there would have been no reason to combine the two, because the structures and uses were very different and would have required "a substantial redesign" of the prior art elements. [A444; A466] The Examiner then allowed the claims. [A478]

Additional prosecution occurred when Appellee Intex initiated *ex parte* reexamination of the '469 patent after three years of this litigation (Serial No. 90/008,926). The claims emerged from reexamination fully confirmed without any amendments, and without any prosecution arguments that limited the claims.

Also relevant to claim construction is U.S. Patent 6,332,760 [A528-38], from which the '469 patent is a continuation-in-part (CIP). The claims of that '760 patent demonstrate why the claims of the '469 patent do not include some unstated

“detachability” requirement. Specifically, although the claims of the two patents have other differences, the relevant limitation differs only in that the ‘760 patent describes the socket and pump as “detachably connected,” while the ‘469 patent does not include such a requirement:

‘760 Patent: “*an electric pump **detachably** connected to the socket to pump the inflatable body*”

‘469 Patent: “*an electric pump connected to the socket to pump the inflatable body*”

[A538 (3:23-24); A295] The Magistrate Judge below found the difference to be centrally relevant to claim construction—i.e., by simple logic, a drafter would not say “detachably” in the ‘760 claim if the word “socket” itself already required detachability. The district court gave this difference no weight in the final claim construction.

As issued, then, and as confirmed in reexamination, the two asserted independent claims address products having pump bodies “wholly or partially located in [a] socket” that is in the inflatable body:

14. An inflatable product including:

an inflatable body;

a socket built in the inflatable body;

an electric pump, including a pump body and an air outlet, connected to the socket to pump the inflatable body, ***wherein the pump body is wholly or partially located in the socket;***

a connector provided on the electric pump for connecting an external power to actuate the electric pump.

16. An inflatable product including:

an inflatable body;

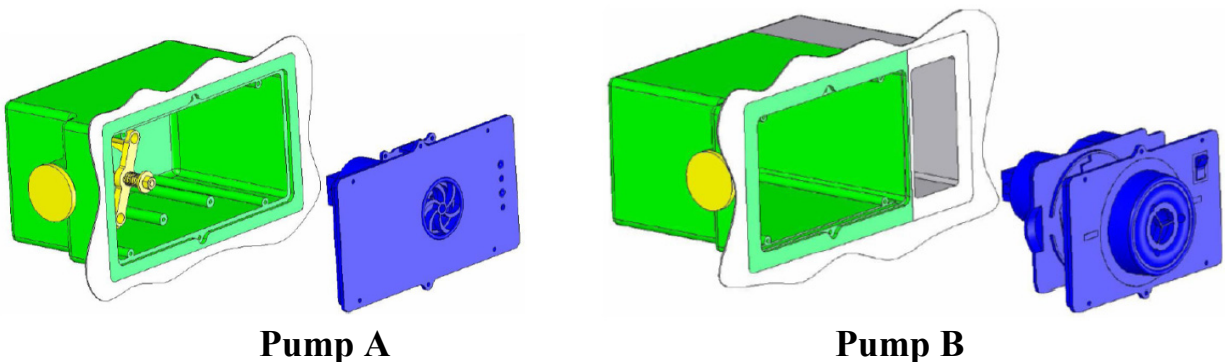
a socket built in the inflatable body;

an electric pump, including a pump body and an air outlet, connected to the socket to pump the inflatable body, *wherein the pump body is wholly or partially located in tile [sic] socket*, a portion of the electric pump is inserted into tile [sic] socket, and the portion of the electric pump and the socket are matched with each other to prevent an air leakage there between.

[A111]

III. The Intex Beds – Pump Bodies Wholly Within Sockets of the Beds

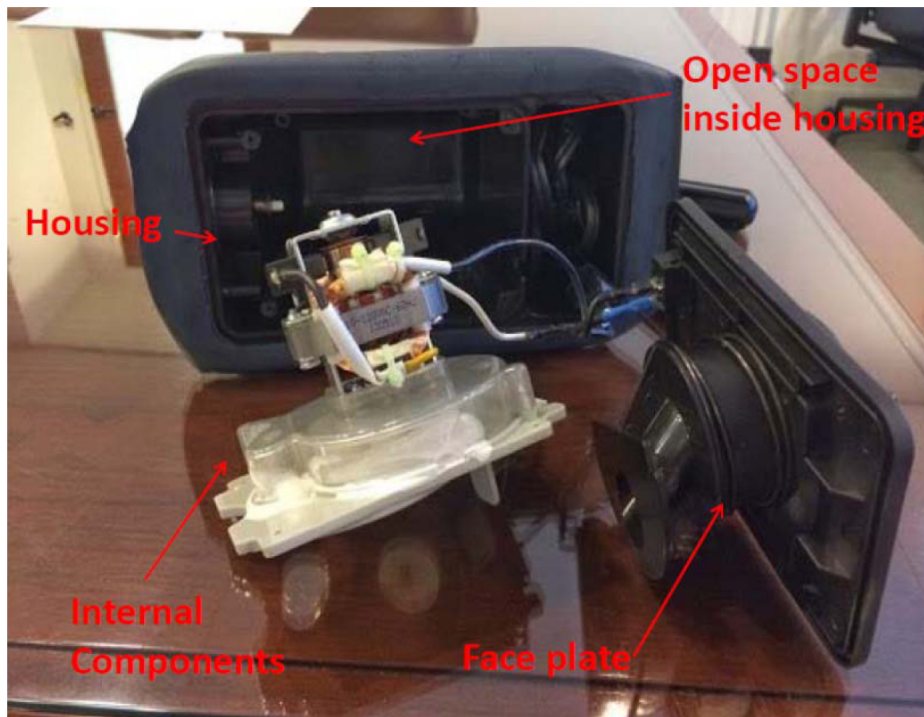
The Intex beds use two primary pump configurations—termed A and B at the district court. Pump A is shown on the left below and Pump B on the right, where the sockets are shown in green and the pumps bodies are shown in blue:



[A1200-05; A1196-1218; A1219-1231; A1316-26] Small shelves, or lips, around the edges of the socket openings fit and hold onto the top plates of the pump bodies, preventing them from falling axially into the socket, and holding them laterally so that they cannot move side-to-side. Screw holes can also be seen in the sockets and pump bodies. Screws (not shown) can be added to further hold the

pump bodies in place. The screws can be removed with a conventional screwdriver, do not require a special tool, and are not welded in place or otherwise permanent. [A1208-09; A1226; A1266-84; A1286-88] There is no dispute that the pumps connect to external power.

The photo below of a Pump B example shows the socket and face plate in black plastic, and the motor connected to a rotating impeller that is inside a clear and tan plastic casing, to move the air:



[A1457] When assembled, this pump body is received into, and fully inside the socket, which is in turn located in the inflatable body of the bed.

Thus, with respect to claim 14 above, for example, both accused systems have “an inflatable body,” “a socket built in the inflatable body,” “an electric

pump, including a pump body and an air outlet, connected to the socket to pump the inflatable body, wherein the pump body is wholly or partially located in the socket,” and “a connector provided on the electric pump for connecting an external power to actuate the electric pump.” All claim limitations are plainly met under the ordinary meaning of the claim language.

IV. This Litigation

Given that the claims so cleanly read onto the accused structures and yet this appeal is up on summary judgment of non-infringement, the district court procedure is centrally important to understanding this result.

This case started as a declaratory judgment action filed by Intex on October 15, 2004. [A147-50] Almost four years into the litigation, Intex moved for a stay in favor of a recently-granted *ex parte* reexamination that it had filed. The district court granted the stay over Team Worldwide’s opposition. [A2776; A2795; A2820] The patent emerged untouched from the reexamination on December 28, 2010, so the court lifted the stay.

A. Claim Construction

For claim construction, the parties agreed before the stay to refer pre-trial issues to Magistrate Judge Deborah Robinson under Federal Rule of Civil Procedure 72. She took *Markman* briefing and construed the claims before the

reexamination. In her order, she construed the term “socket” according to its ordinary meaning, as:

“an opening or hollow that forms a holder for something.”

[A71-72] She declined Intex’s invitation to read limitations into the claims (e.g., requiring the socket to have a detachable connection), noting that (a) “the embodiments in the ‘469 patent do not limit the claims, as expressly stated in the patent”; (b) the parent ‘760 patent “expressly used the term ‘detachably connected,’ but in the ‘469 patent [the] term is not used”; and (c) “the undersigned did not find anything in the intrinsic evidence that requires a part inserted into the socket to be ‘detachably connected.’” [A65-80, at 70-72]

After the stay was lifted, the district court construed the claims anew, declining to give any deference to Magistrate Judge Robinson’s constructions, because “[t]he interpretation of patent claims is exclusively a question of law.” [A11 (*quoting In re Pabst Licensing GmbH & Co. KG Litig.*, 670 F. Supp.2d 16, 27 (D.D.C. 2009))] As to the ordinary meaning of “socket,” the court recognized that the term “has a broader meaning as well” that matched Magistrate Judge Robinson’s definition. The court recognized that detachability was not an “essential characteristic” of the socket, and further that “[t]here is no indication from the language of claims 14 and 16 as to whether the connection is permanent or detachable.” [A19] The district court did not find any disavowals, disclaimers,

or lexicography with regard to the term. It nonetheless added two limitations to Magistrate Judge Robinson's construction:

- (a) that the socket "fits and holds onto an inserted part"; and
- (b) that the "structure and the part are detachably connected to each other."

[A37]

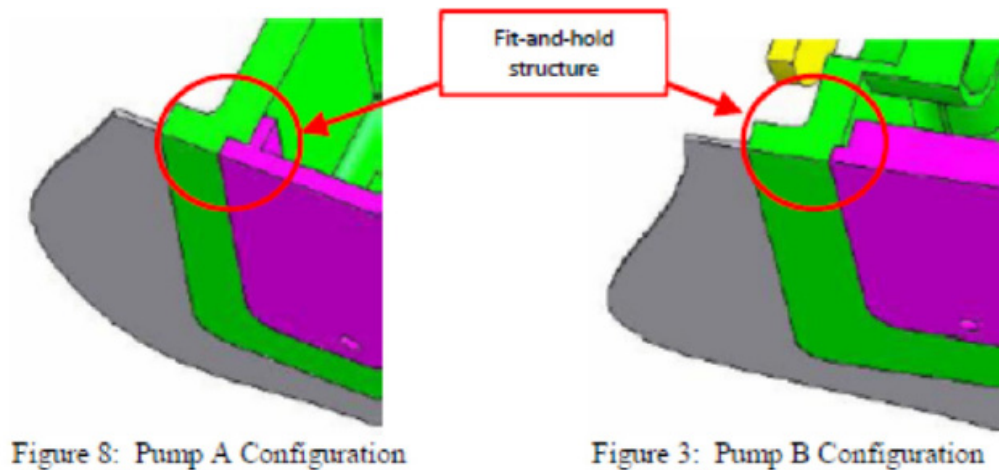
The district court added these limitations by combining a statement in the Summary of the Invention regarding detachability with statements about socket detachability for embodiments 1-7, as "support[ing] Intex's proposed construction." [A21] The court juxtaposed embodiments 1-7 (which, among many other features, were detachable) with embodiments 8-10, which it wrongly believed "all ... require a connection that is permanent or has the option of being permanent" and which it wrongly believed were carved out by restriction during prosecution. [See A28] It was wrong about embodiment 8-10 because only embodiment 10 speaks of permanent attachment. Its error on the restriction came from the following chain of logic:

- Cancelled claims 12 and 13 were directed to embodiments 8 and 9, and cancelled claims 15 and 16 were directed to the embodiment 10.
- Because the restriction requirement identified claims 12 and 13 as being Group III and claims 15 and 16 as being Group IV, and the inventor selected Group II, the "prosecution history thus clearly indicates that embodiments 8 through 10 do not teach the claims in the '469 patent."

[A22-27] The district court, of course, failed to consider or comprehend a situation in which the restriction groups overlap embodiments—e.g., Groups II, III and IV concerned features present in the same embodiments. So strong was the district court’s conviction that restriction groups could not overlap that it was surprised the inventor did not amend the specification to remove the description of embodiments 8-10—and called the failure to amend the specification after the restriction “inadvertent[], it seems.” [A23] It is this misunderstanding of the law, patent specification, and import of the restriction and election that was the district court’s first error, and that alone requires reversal.

B. Summary Judgment

Notably, even with the district court’s importation of limitations into the term “socket,” the construction still only required “a structure that fits and holds onto an inserted part so that the structure and the part are detachably connected to each other.” [A37] Thus, Team Worldwide moved for summary judgment of infringement and defended against Intex’s motion for summary judgment of non-infringement by introducing evidence and an accompanying explanation from its expert; Team Worldwide established that the lip around the edge of the socket in the Intex products “fits and holds” the inserted pump body, such as in the following zoomed-in images [E.g., A2194-97]:



As these figures make clear, the green socket “fits” tightly all around the periphery of the magenta plate of the pump body, and “holds” the plate from falling inward or sliding sideways in any direction. Team Worldwide also presented evidence that the plate is further held in place by ordinary screws, which can be removed by a household screwdriver, making the socket readily “detachable.” [A55; A60; A1208-09; A1226; A1266-84; A1286-88]

Despite this evidence on a material fact issue, the district court granted summary judgment of non-infringement. [A38-64] With respect to “socket,” the court started by adding another requirement, not in its claim construction and not even in embodiments, like the First Embodiment which the court itself recognized was an “embodiment[] of the claimed invention”—i.e., that the socket must also “grip” the pump body in the manner a light bulb is gripped by, and thus detachable from, a light socket, or a mason jar is gripped by its lid:

In the claim construction proceedings, the parties and the Court used the phrase “to fit and hold onto” as meaning “to grip,” akin to a light

bulb socket that fits and holds onto a light bulb, or electric socket that fits and holds a plug, or, as discussed at oral argument, a lid that fit and holds onto a mason jar.

[A55] The district court reasoned that, in contrast to a light bulb or mason jar, the Intex pump bodies are not held from falling out when tipped upside down unless the screws are in place—thus apparently adding a new requirement that the claimed “socket” must hold the inserted part in all Cartesian directions, and perhaps via threads (which are what hold a light bulb or mason jar cover and prevent them from falling out or off). Although the Intex screws fix that problem (also with threads, of course), the district court was of the opinion that removal of ten screws resulted in “effectively disassembling the pump”—something the district court felt was, as a matter of law, “quite different in form from turning the lid of a mason jar or unscrewing a light bulb.” [A56]

Separately, the district court made the further fact finding that the green structures shown above are parts of the pumps, and thus cannot be “sockets” in which the pump bodies are located. The court concluded that the pumps would not work without the green structures, yet the court did not explain what it meant for the pumps to not “work.” As explained in more detail below, the sockets *inter alia* receive the pump body, and help route air in or out of the beds. Components other than the green structures still move air, and thus are pumps. What the district court did not do is ask whether the components in blue/magenta above—and

identified as pump bodies by Team Worldwide and its expert—were in fact “pump” or “pump bodies” (or could be found to be such by a reasonable jury) even without the structure identified by Team Worldwide as “sockets.” The district court relied on this same reasoning in finding no infringement under the doctrine of equivalents.

Having made such fact findings as to the *degree* of removability and gripping that would suffice for infringement, the *degree* of difference between the detachability of the accused structures relative to that of light bulbs and mason jar lids, and with regard to the *degree* of difference that would satisfy an equivalents finding, the district court entered summary judgment of non-infringement. This appeal followed.

SUMMARY OF THE ARGUMENT

The district court misunderstood the patent law and practice, the ‘469 patent, and the prosecution history when it imported limitations into the claims. Despite correctly acknowledging that the ordinary meaning of “socket” is broad, the district court’s conclusion that the inventor narrowed the term by allegedly abandoning embodiments 8-10 via an election was legal error because: (a) the restriction and election divided the claims by claimed features rather than by embodiments; (b) the claims refer to pump bodies “wholly or partially” in the socket, which necessarily implicates embodiments 8-10; and (c) the inventor

explicitly pointed to the Eighth Embodiment post-election as an embodiment of the asserted claims.

The district court later further narrowed the claims in an unsupportable manner. It added requirements that the socket “grip,” and be detachable from, an inserted part in the way a light socket or mason jar lid detaches—including by stopping motion in all Cartesian directions—even though embodiments that the district court called “embodiments of the claimed invention” did not do so.

On summary judgment, the district court improperly found facts by taking a term of degree like “detachable,” and deciding that no reasonable jury could find “detachable” met by a structure that could be readily detached. The court then extended its other errors by not accepting Team Worldwide’s evidence identifying the structures in the accused products that matched the “socket” and “pump body” claim limitations. These legally improper approaches to summary judgment and infringement led the court to grant an improper judgment.

ARGUMENT

I. Standard of Review

Under current law, claim construction is a question of law that this Court reviews *de novo*. *Lighting Ballast Control LLC v. Philips Elecs. N. Am. Corp.*, 744 F.3d 1272, 1277 (Fed. Cir. 2014) (en banc); *Teva Pharms. USA, Inc. v. Sandoz, Inc.*, 723 F.3d 1363, 1373 (Fed. Cir. 2013), *cert. granted*, 82 USLW 3469 (Mar.

31, 2014). Summary judgment is also reviewed wholly *de novo*, and should be granted only after making all reasonable inferences in favor of the non-movant, and determining that no reasonable jury could find for the non-movant. *See* Fed. R. Civ. P. 56(a); *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 255 (1986).

II. The District Court Erred in Reading Limitations Into the Claims

It is a “bedrock principle” that “the claims of a patent define the invention to which the patentee is entitled the right to exclude,” so that claim construction must focus on the claim language itself. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (*en banc*) (internal quotation marks omitted). Claim terms “are generally given their ordinary and customary meaning” as understood by the skilled artisan in the context of the specification. *Id.* (internal quotation marks omitted). “There are only two exceptions to this general rule: 1) when a patentee sets out a definition and acts as his own lexicographer, or 2) when the patentee disavows the full scope of a claim term either in the specification or during prosecution.” *Thorner v. Sony Computer Entm’t Am., LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012); *see also GE Lighting Solutions, LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1309 (Fed. Cir. 2014) (“[T]he specification and prosecution history only compel departure from the plain meaning in two instances: lexicography and disavowal.”). Where “the claim language is clear on its face, then consideration of the rest of the intrinsic evidence is restricted to determining if a deviation from the

clear language of the claims is specified.” *Interactive Gift Express, Inc. v. Compuserve Inc.*, 256 F.3d 1323, 1331 (Fed. Cir. 2001).

A. The ‘469 Claim Language is Broad, as the District Court Recognized

The claim language here is undeniably broad, as the district court recognized. Team Worldwide provided evidence of the broad meaning of “socket” in both the technical and nontechnical contexts. Specifically, Webster’s Ninth New Collegiate Dictionary (1991) defines “socket” as “an opening or hollow that forms a holder for something.” [A489-90; A495] The Dictionary of Mechanical Engineering defines it as “a hollow for something to fit into, or stand firm, or revolve in.” [A511-13] Thus, there can be no question that the ordinary meaning of the term is broad and consistent with Team Worldwide’s proposed construction.

The limited evidence Intex provided on ordinary meaning further supports Team Worldwide’s construction. For example, Intex pointed to the following definition from the American Heritage College Dictionary: “an opening or a cavity into which an inserted part is designed to fit: a light bulb socket.” [A960-61; A964] That definition is the same in substance as Team Worldwide’s construction.² What went wrong below? Intex’s and the district court’s treatment

² Intex also submitted the following definition from the McGraw-Hill Dictionary of Scientific and Technical Terms 1853 (5th ed. 1994): a “device designed to receive and grip the end of a tubular object, such as a tool or pipe.” [A967-69] However,

of the definition, by which they turned the *example* of a light bulb socket (which should not be limiting) into a form of limitation in their construction; they found that something could not be a socket unless it operated like a light bulb socket (or a mason jar lid), *infra* pages 35-38. Yet examples are not limitations.

The district court also erred by not accepting the broad ordinary meaning as a baseline for its analysis, finding it inconclusive because the broad definitions also covered Intex's proposed construction. [A18-19] However, a broad ordinary meaning will always cover a proposed narrow construction. It is only where a term has two distinct and exclusive, equally plausible ordinary meanings that the court throws up its hands on ordinary meaning and moves on—*e.g.*, *Renishaw PLC v. Marposs Societa Per Azioni*, 158 F.3d 1243, 1247-48 (Fed. Cir. 1998). Where the broad ordinary meaning is clear, that ordinary meaning applies unless there is lexicography or a clear disavowal of claim scope. *E.g.*, *Thorner*, 669 F.3d at 1365; *GE Lighting Solutions*, 750 F.3d at 1309.

The district court ultimately appears to have misunderstood the proper procedure for claim construction, criticizing Magistrate Judge Robinson for allegedly following *Texas Digital Sys., Inc. v. TeleGenix, Inc.*, 308 F.3d 1193 (Fed. Cir. 2002), even though her analysis directly tracked this Court's *en banc Phillips* decision. The district court missed that the central problem of *Texas Digital* was

even Intex did not argue that “socket” must be limited to gripping of tubular objects, so that definition is inapplicable here.

not looking to dictionaries as evidence to establish an ordinary meaning for a claim term, but rather following dictionary definitions without due attention to the intrinsic patent record. *See Phillips*, 415 F.3d at 1320. Magistrate Judge Robinson’s analysis cannot be criticized on this ground—she pointed out that the presented evidence supported one particular broad meaning for “socket.” [A72] That meaning, as explained by Judge Robinson, was not only consistent with the intrinsic record but full bolstered by it. [*Id.*] In short, this is not a *Texas Digital*-type case because the intrinsic record is in harmony with the broad ordinary meaning of “socket.”

The district court also erred by giving no weight to the clear implication of the different language used in the ‘760 patent claims versus the ‘469 patent claims. The district court reasoned that no weight was warranted because “detachability” is not the only difference between the ‘760 claims and the ‘469 claims.³ This was legal error for two reasons. First, detachability was the only difference for the relevant limitation in claims between the ‘760 patent and the claims filed in the child ‘469 application. The implication from the use of “detachably” in one claim

³ The district court declined to consider claim differentiation, citing *Nystrom v. Trex Co.*, 424 F.3d 1136, 1143-44 (Fed. Cir. 2005). [A26] But in *Nystrom*, this Court acknowledged the presumption from claim differentiation and found it overcome by universal and repeated statements made in the specification and universal and repeated statements made in the prosecution, *id.* at 1143-45—neither of which are present here even under the district court’s characterization of the specification and prosecution history.

and not the other is plain from ordinary logic—i.e., that a “socket” does not require a “detachably” connected structure in the latter:

Parent ‘760 claim 1	Child ‘469 claim 17 (issued claim 14)
17. An inflatable product including: an inflatable body; a socket built in the inflatable body; <i>an electric pump detachably connected to the socket to pump the inflatable body</i> ; and a battery case also built in the inflatable body for receiving batteries to supply the electric pump with power.	17. An inflatable product including: an inflatable body; a socket built in the inflatable body; <i>an electric pump connected to the socket to pump the inflatable body</i> ; a connector provided on the electric pump for connecting an external power to actuate the electric pump.

Under the district court’s view, the inventor included the word “detachably” in the original ‘760 claims even though that word was wholly superfluous (because detachability is an implicit feature of any “socket” in the district court’s view), then went out of his way to remove the term from the child application claim even though that would do nothing to change the claim scope. With all due respect, the district court’s reasoning is illogical and erroneous.

Second, this Court has made plain that the inference from claim differentiation is “especially strong” in dead-on situations (where ignoring differentiation would make the claims identical in scope), but that the implications of different claim wording must be considered in any event, even if it would not result in claims with identical scope. *Hill-Rom Servs., Inc. v. Stryker Corp.*, -- F.3d --, --, 2014 WL 2898495, at *4 (Fed. Cir. June 27, 2014). In other words, the test is not tied to formalities, but to what is logically implied by the differences in the

claims. Here, the clear implication of the inventor's removal of "detachably" for the '469 claims was to remove that term as a limitation on the claims. Indeed, the district court never found otherwise—it simply declined, erroneously, to deal with the issue under its mistaken view that claim differentiation has no role at all unless the claims would be wholly redundant absent application of differentiation. Magistrate Judge Robinson had it right.

B. The Specification is Broad, as the District Court Recognized

The specification is "always highly relevant" to claim construction. *Phillips*, 415 F.3d at 1315 (internal quotation marks omitted). However, the specification must be used with care because "it is improper to read limitations from a preferred embodiment described in the specification" into the claims. *Dealertrack, Inc. v. Huber*, 674 F.3d 1315, 1327 (Fed. Cir. 2012) (internal quotation marks omitted). After all, a "patentee need not describe in the specification every conceivable and possible future embodiment of his invention." *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002) (internal quotation marks omitted).

Here, the specification is broad. It does not tie patentability to the attachability or detachability of the pump body to the socket. The specification discloses a variety of embodiments—some detachable and some not, and some silent on the issue of detachability. For example, the First Embodiment is described as being inserted to inflate the bed, then, "[i]n the deflating operation,

the user detaches the electric pump 20 from the socket 24 to deflate the airbed 26, as shown in FIG. 3B.” [A85-86; A109(3:1-6)]

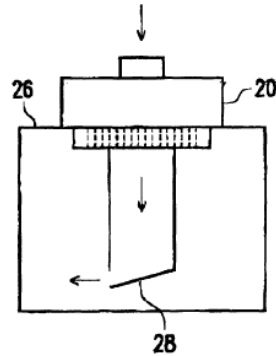


FIG. 3A

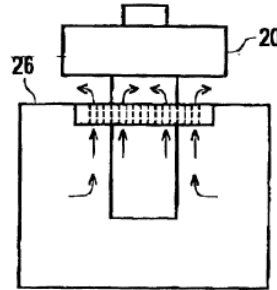


FIG. 3B

Similarly, the Fourth Embodiment (FIGs. 9a and 9E below) shows a pump 52 that has batteries on its inside and that interfaces with sockets 56 and 56' to inflate the bed when it is inserted in one direction, and deflate the bed when it is inserted in the other direction. Others of embodiments 1-7 worked similarly.

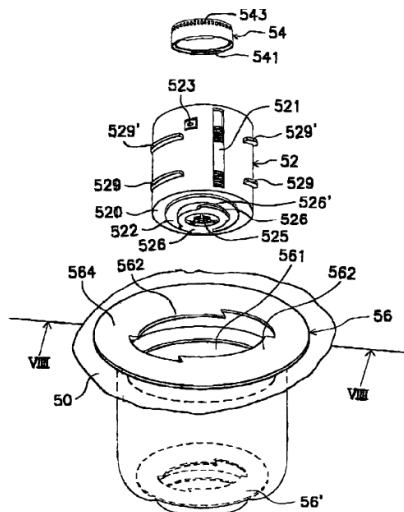


FIG. 9A

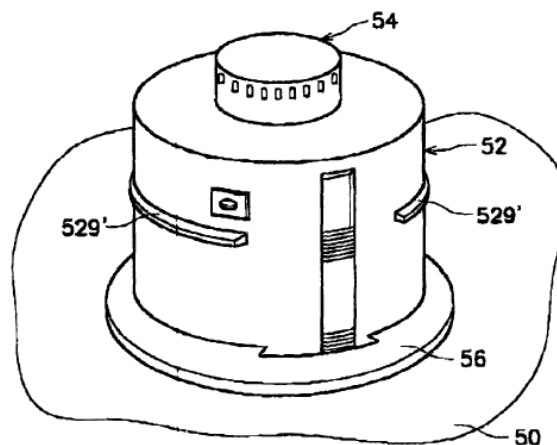


FIG. 9E

[A96-99; 109-110 (4:64-5:60)] The Eighth Embodiment (FIG. 13A) and the Ninth Embodiment (FIG. 14) use pumps whose blades can spin in either direction. [A96;

A99; A110-11 (6:26-65)] The specification is silent on whether the pumps in these embodiments are detachable. The Tenth Embodiment (FIG. 15) uses separate pumps for inflating and deflating, and is permanently or detachably connected to the bed. [A107; A110(6:66-7:11)]

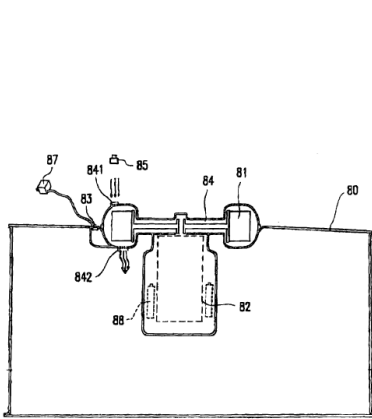


FIG. 13A

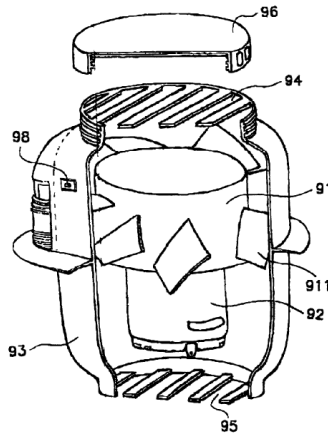
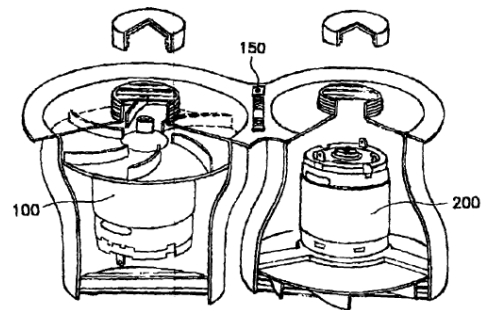


FIG. 14



Intex argued to the district court that a wide and bright line should be drawn between embodiments 1-7 and embodiments 8-10 because the word “socket” is used with the former, while the word “chamber” is used with the latter. Under Intex’s view, those are distinct and mutually exclusive terms. However, while they are indeed different words, there is nothing in the intrinsic record to show that they are mutually exclusive. Rather, a “socket” simply denotes “an opening or hollow that forms a holder for something,” by its ordinary meaning. [A489-95, at A495; *see also* A496-501, at A501] A “chamber” is something that could be defined by a socket. Thus, the enclosed spaces of embodiments 8-10 certainly are chambers, but that space we call a chamber is still defined by sockets, and the inventor by referring to the space (the chamber) that distinguishes them from other embodiments, did not extinguish or disclaim the structure (the socket) that was common with the other embodiments.

Also, Intex improperly led the district court to conclude that “chamber” equates to permanent connections (which was a central pillar for the court’s ultimate construction), for in the district court’s view “all” the embodiments of the unelected claims “require a connection that is permanent or has the option of being permanent,” and:

Mr. Wang [the inventor] consistently used the term ‘socket’ when describing embodiments with detachable connections, and ***consistently used the term ‘chamber’ when describing connections***

that had the option of being permanent, [so] the terms refer to distinct concepts.

[A28] The assumption of this point—i.e., that “all” of embodiments 8-10 require a permanent connection—is simply wrong. Only the Tenth Embodiment is discussed with respect to permanence or detachability. [A111 (7:2-3) (“The first and second fans and motors . . . are permanently or detachably connected to the airbed.”)] The Eighth and Ninth Embodiments are not so described. This is a critical point, because the district court’s ultimate holding depends, at its core, on the assumption that the patent has only two groups: “detachable”/“socket” embodiments and “permanent”/“chamber” embodiments. Without the connection between chambers and permanent connections in embodiments 8 and 9, the house of cards tumbles.

Intex also pointed to the following statement in the specification that mentions “the present invention”:

The airbed of the present invention includes an inflatable body, a socket, an electric pump and a battery case. The socket is built in the airbed. The electric pump is detachably connected to the socket to pump the airbed. The battery case is also built into the airbed for ease of loading batteries that supply the electric pump with power.

[A108 (1:30-35)] For at least three reasons, this statement does not warrant reading a “detachability” limitation into the claims any more than it would warrant reading in an unclaimed “built in battery case” limitation. First, this Court’s decisions regarding statements about “the present invention” require more than

such a basic statement to warrant importation. They require clear and repeated assertion that a particular feature is key to the invention, statements that are general across the whole invention, or clear statements that distinguish a feature from the prior art in a way that makes clear that the specification was using “invention” as a distinctive feature, and not merely a more general statement that is frequently used loosely in patent law.⁴ None of those situations exist here. The “present invention” language appears at best in passing, not to distinguish something that was not “the present invention.”

Second, as just alluded to, the statement about the “present invention” is in a sentence that lists general components. The statement about detachability is in a separate, second sentence that says nothing about “the present invention.” This is not a hyper-technical distinction, because the third sentence—about the battery case being built into the bed—takes the same form. Yet there is no suggestion that the claims have to be limited to the embodiments that show batteries in the bed rather than right in the pump. In short, this plain division between the statement

⁴ See *GE Lighting Solutions*, 750 F.3d at 1309 (identifying cases in which statements about “the present invention” have been read as a limitation as involving: (a) statements that a particular step was “require[d]”; (b) characterized a feature as “an important feature of the present invention”; (c) “repeatedly disparaged an embodiment as ‘antiquated,’ having ‘inherent inadequacies,’ and then detailed the ‘deficiencies [that] make it difficult’ to use; and (d) “when the specification described that feature as a ‘very important feature ... in an aspect of the present invention,’ and disparaged alternatives to that feature.”) (citations omitted).

about “the present invention” and the separate statements about detachability and built-in batteries further blocks any attempt to read the detachability feature into the claims.

Third, the prosecution history shows that the claimed invention of the ‘469 patent does not require detachability, even though part of the claim of the ‘760 patent did. In particular, as described above, the inventor recited detachability explicitly in the ‘760 claims and then removed it when filing the ‘469 CIP. This was the only change made to that limitation. It clearly and objectively shows an intent to not have “detachability” be part of the limitation. This Court has held that statements about “the present invention” do not apply when the prosecution history clearly shows those statements were directed to an invention addressed by one application in a family, and not to the patent-in-suit. *See LG Elecs., Inc. v. Bizcom Elecs, Inc.*, 453 F.3d 1364, 1378 (Fed. Cir. 2006), *overruled on other grounds*, 553 U.S. 617 (2008); *see also Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1311 (Fed. Cir. 1999). The same principle applies here—i.e., “detachability” was plainly claimed in the ‘760 patent and plainly **not** claimed in the ‘469 patent. So the statement about “the present invention” does not merit importing a detachability limitation for this independent reason.

Finally, and perhaps most notably, even the district court was unwilling to read limitations into the claims based solely on the specification statement. It

relied ultimately on its interpretation of the prosecution history [A22], which we turn to next.

C. The District Court Erred By Limiting the Claims Based on the Prosecution History

The factor that ultimately drove the district court’s claim construction—even apart from its error in not even looking for lexicography, disavowal, or disclaimer after acknowledging the broad ordinary meaning for “socket”—was its belief that the inventor had disclaimed embodiments 8-10 in response to a restriction requirement. The court was wrong on that count for at least two independent reasons.

First, while restrictions can be phrased in terms of particular figures or embodiments, this one was not. *E.g.*, MPEP 817. Rather, the Examiner broke up the four inventions by particular claims and associated concepts. The district court seems to have reasoned that because some of the unelected claims covered embodiments 8-10, the elected claims necessarily could not. [A26-27] Indeed, the district court went so far as to surmise that, by normal process, the inventor should have deleted all description of embodiments 8-10 after the election in response to the restriction. The district court speculated that a failure to do so was “inadvertent[], it seems.” [A23] But of course, Applicants are not prevented from having overlap of embodiments in their claims. And that is exactly what occurred

here. The elected pending claim 17 covers all the relevant embodiments, even though some of the unelected claims cover only a sub-set of embodiments:

17. An inflatable product including:

- an inflatable body;
- a socket built in the inflatable body;
- an electric pump connected to the socket to pump the inflatable body;
- a connector provided on the electric pump for connecting an external power to actuate the electric pump.

[A295] Thus, the district court's first error on the prosecution history was its assumption that the inventor in electing Group II necessarily disclaimed embodiments 8-10.

A more fundamental error in the court's reasoning was the failure to appreciate that, when the inventor added the "wholly or partially" language to the claims, after the restriction, he pointed for support to "page 6, lines 4-20 and page 12, line [sic, 12] to page 13, line 2 ..., and in Figs. 6A, 6B, 13A and 13B." [A408] Figures 13A and 13B are the Eighth Embodiment, as are pages 12-13 of the original specification:

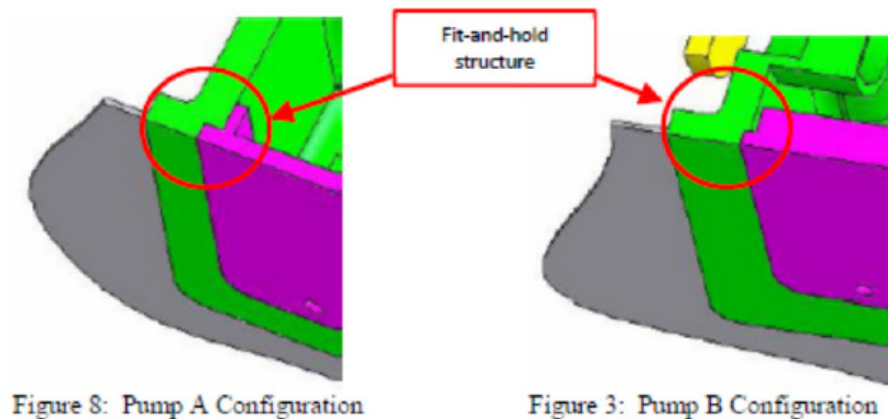
Referring to Fig. 13A, an airbed 80 of an eighth embodiment of the invention is provided a cover 85, a chamber 84, a fan 81 received in the chamber 84, a motor 82 for rotating the fan 81, a plurality of rechargeable batteries 88 for supplying the motor 82 with power, and a switch 83 for actuating the motor 82.

[A289] Therefore, after the restriction—which the district court critically misunderstood to have disclaimed the Eighth Embodiment—the inventor explicitly

referred to the Eighth Embodiment as being encompassed by the claims. For this independent reason, the district court's treatment of the prosecution was wrong, and its judgment should be vacated.

D. The District Court Erred Even Further By Adding Unsupported Limitations on Summary Judgment

The district court's stated construction of "socket" required "a structure that fits and holds onto an inserted part so that the structure and the part are detachably connected to each other." Relying on that construction, Team Worldwide presented evidence that the Intex sockets in the beds certainly do "fit and hold" the plates of the Intex pumps, as exemplified in the following images:



[A1210; A12319-1230; A1270-83; A1316-26; A2194-97] But that was not enough, because the district court announced in connection with its ruling on summary judgment that the socket must also "grip" the pump like a light socket grips a bulb or a mason jar cover grips the jar. Finally, the district court erroneously added a requirement that the pump must be "manually" detachable (by

hand alone), rather than detachable with tools. [A60 (“[T]o remove the pump, a user cannot do so manually, but must take the pump apart with a screw driver. This is not ‘detachably connected.’”).] Yet, the ordinary meaning of “detachable” has no “manual” requirement.

Aside from being an improper change in the construction, this further narrowing was wholly unsupported by any intrinsic or extrinsic evidence, and the intrinsic evidence actually refutes it. First, the district court itself only reached its express construction via its mistaken understanding of the restriction and corresponding response. Thus, the claim language and specification could not include support for these further limitations. And they do not. Likewise, the restriction and election cannot support the further limitations. It merely reaches back to the specification, which the district court recognized as not limiting.

Rather, the introduction of the “grip like a bulb/mason jar” additional limitations plainly come only from the dictionary definition that gave a light bulb as an *example* of something that uses a socket. But that mere example is not a limitation. And there is absolutely no precedent to take the extra step and say that an accused product must operate like a light bulb socket or mason jar lid to infringe. Indeed, those sockets “grip” the bulb or jar only via spiral threads on their inside. If the threads were removed, the bulb or jar would fall away quickly and freely. Yet the district court never mentioned how it, or anyone else, would

determine whether a structure operated sufficiently differently from a light bulb socket to assess infringement under its construction. And the Court did not consider whether the removable screws might be considered part of the socket (or the pump) that are unnamed in the claim,⁵ but work in concert with the plastic to perform the court's "hold onto" / "grip" function.

Perhaps more fundamentally, the very embodiments in the patent to which the district court said the claims were directed (a) do not all have threads to grip, (b) do not say anything about preventing a pump from falling out if it is held upside down, and (c) do not show structures that would hold in the pump. For example, the insertion and removal of the First Embodiment is shown in FIGs. 3A and 3B, with the electric pump being smooth on its periphery, without threads or any other disclosed structures to hold it in:

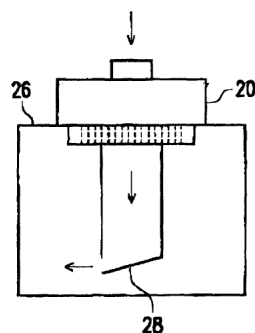


FIG. 3A

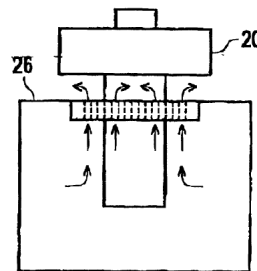


FIG. 3B

[A85; A108-09 (2:50-3:9)]

⁵ *Genentech, Inc. v. Chiron Corp.*, 112 F.3d 495, 501 (Fed. Cir. 1997) (“‘Comprising’ is a term of art used in claim language which means that the named elements are essential, but other elements may be added and still form a construct within the scope of the claim.”).

The district court never considered this point in its opinion. If it had, it would be unable to find any teachings of a structure that would prevent the pump 20 from falling out if it were tipped over—the exact thing that the court said distinguished the accused pumps from the claims. In short, the added “grip like a bulb socket or mason jar lid” limitations are unsupported, introduce limitations that appear nowhere in the claim language, and even exclude undisputed embodiments. Of course, such a construction is “rarely, if ever correct”⁶ in general, and in this particular instance, is not correct.

III. The District Court Improperly Found Facts on Summary Judgment

Even with all of the district court’s requirements—both explicit and implicit—loaded into the claims, Team Worldwide still presented substantial evidence of infringement, both literal and under the doctrine of equivalents.

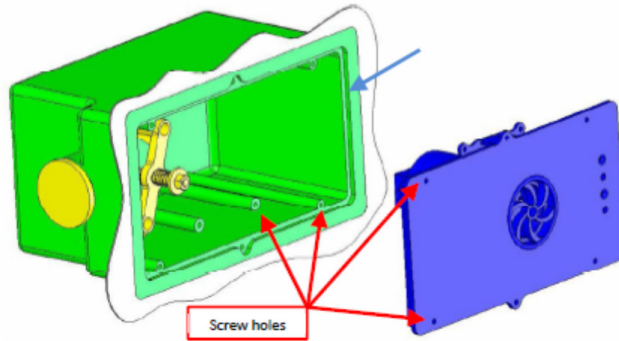
A. Literal Infringement

1. The District Court Erred By Finding Facts Regarding the Detachability and Gripping of the Intex Pump Bodies From the Sockets

With respect to the district court’s imported “detachability” and “grip” requirements, Team Worldwide introduced substantial evidence that should have defeated summary judgment. For example, Team Worldwide showed graphically, and explained through its expert, how the green socket (below left) and the

⁶ *MBO Labs., Inc. v. Becton, Dickinson & Co.*, 474 F.3d 1323, 1333 (Fed. Cir. 2007).

blue/magenta pump plate (below right) are geometrically matched, with the pump plate fitting tight so that it could not move [See A1210; A12319-1230; A1270-83; A1316-26; A2194-2201]:



[A1200-01] Team Worldwide showed the “fit-and-hold” character of the accused products—which addressed the requirements of the district court’s construction both where the plate fits into the socket and is held by it, and also where the light blue portion of the impeller structure in the Pump B configuration is fit and held [A2194-97]:

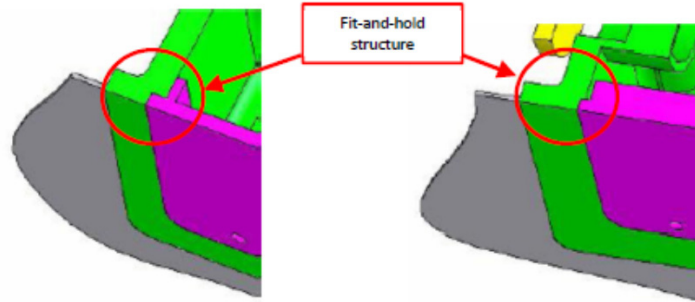


Figure 8: Pump A Configuration

Figure 3: Pump B Configuration

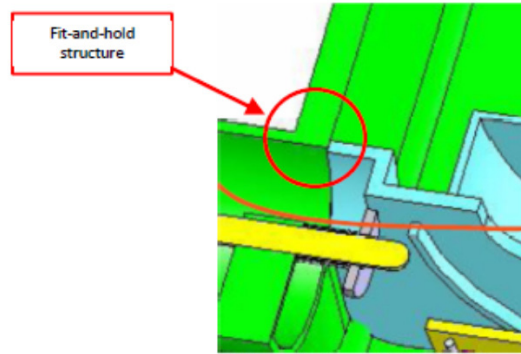


Figure 3: Pump B Configuration

With respect to the district court's new "grip" requirement, the structures shown above have a flange extending inward into the socket that matches the inward-extending tube in the First Embodiment shown in Figures 3A and 3B below, and which the district court said was an "embodiment[]" of the claimed invention." [A7] So whatever the district court meant by "grip" is also met by the accused inflatable beds.

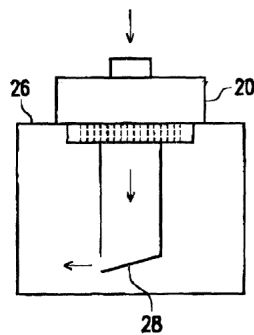


FIG. 3A

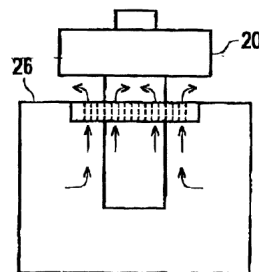


FIG. 3B

[A85; A108-09 (2:50-3:9)] The accused structures actually have more “grip” than the First Embodiment because they prevent the rectangular plate from rotating, while the First Embodiment has no such structure. More generally, the sockets in the accused beds stop any motion in 5 of 6 possible Cartesian directions (both directions in the x- and y-axes, and one in the z-axis) **and** prevent any rotation of the pump (which is more than the First Embodiment does to immobilize the pump). Whatever “grip” means (and it certainly is not clear from the district court’s opinion), the accused beds thus do more than the “claimed embodiments.”

The Court also impermissibly found facts against non-movant Team Worldwide in ruling that partial disassembly was different than detachability. [A56] Yet, the very notion of detachability requires that something is disassembled. Moreover, the district court ignored the difference in attachment methods specifically pointed out by Intex, i.e., that the sockets are “welded” to the inflatable mattresses (*see, e.g.*, A1420; A1428-29) while the pump is screwed to the socket. The “welded” connection is inherently **not** detachable without damage to the mattress; but the screws are inherently detachable and re-attachable without any damage to the mattress. Yet the district court gave no consideration to the distinction between welding and screwing when it found that unscrewing a pump body is not detaching the pump body.

In granting summary judgment on the “detachability” and “grip” bases, the district court also erred by presuming that it could decide infringement as a legal issue because “the parties agree on the features of the accused device.” [A52] This Court’s law on the point is not so simplistic. Certainly, where the proffered claim constructions are such that the terms of the constructions necessarily match or fail to match the agreed-upon structure of the accused products, then infringement does “collapse” into claim construction. *See, e.g., Desper Prods, Inc. v. QSound Labs, Inc.*, 157 F.3d 1325, 1332 (Fed. Cir. 1998). Indeed, given that “detachability” should be understood to be a binary concept, since the pumps in Intex’s products can be detached from their sockets, application of this principal should have led the district court to enter summary judgment of infringement for Team Worldwide. The relevant requirement under the district court’s stated construction is that the pump body be “detachable” from the socket, and here, the pump bodies are very much detachable from the sockets, by simply removing a few screws.

Here, though, the district court in applying its “detachable” requirement in the context of summary judgment applied the term in an analog, and relative manner. Even assuming *arguendo* that the claim language drew a line depending on degree or ease of detachability, this the Court has repeatedly found disputed fact issues to exist, even where the mechanical structure of the accused device is not in

dispute, if there is a genuine question whether the terms in the claim construction match that structure. For example, in *International Rectifier Corp. v. IXYS*, 361 F.3d 1363, 1374-75 (Fed. Cir. 2004), the Court denied summary judgment by distinguished cases in which “the parties agreed ... about how each of the two competing claim constructions would apply to the undisputed structure of the accused invention,” from its facts where “only the structure of [the accused infringer’s] product has been stipulated to for summary judgment purposes, not the factual determination of whether that product meets one or another claim construction.” *See also Uniloc USA, Inc. v. Microsoft*, 632 F.3d 1292, 1302 (Fed. Cir. 2011) (finding fact issues where “the application of [the] claim construction to the accused device” was disputed).

That is precisely the case here. The relevant requirement is that the pump be “detachable” from the socket. And here, the pump bodies are very much detachable from the sockets by simply removing a few screws. This court has identified no legal limit that would prevent a jury from deciding such an issue; and the district court did not identify one. Certainly, any jury would find the structures to be detachable and that Team Worldwide introduced substantial evidence to that end.

Indeed, the most factually analogous decision from this Court had much stronger facts for granting summary judgment of non-infringement, and yet the

Court vacated. In *Dorel Juvenile Group, Inc. v. Graco Children's Products, Inc.*, the claim called for a child's car seat where a base was “**removably attached** and arranged to support the seat.” 429 F.3d 1043, 1044-45 (Fed. Cir. 2005). The accused seats had two models—one that attached the seat to the base with screws “removable with ease by use of a common screwdriver,” and another using one-way screws. Applying the ordinary meaning of the claim language, the district court granted summary judgment of non-infringement because the accused seats did not “remain[] functional” if they were removed from the bases. *Id.* at 1046. This Court, in vacating and finding that the “district court has invaded the province of the finder of fact,” noted that “[t]he accused products comprise a top structure and a bottom structure, each easily removable from the other by an ordinary or one-way screwdriver, such that that are ‘removably attached’ or ‘removably secured.’” *Id.* at 1046. Although determining that the structures were most definitely “removable,” the Court remanded because there was a fact issue on a separate claim requirement. *Id.* The dissent felt different because, by the dissent's characterization:

The Graco carseat is a permanent assembly whose molded parts are permanently screwed together with six “one-way” screws. Upon unscrewing and disassembly, the Graco seat becomes a collection of loose parts, the cup holder incapable of its function of supporting a cup.

Id. at 1047. The relevance of *Dorel* is that the majority expressly concluded that the presence of multiple screws did not defeat “removability,” and found the removability requirement met even though they were not meant to be removed, and removing them eliminated the functionality of the assembly.

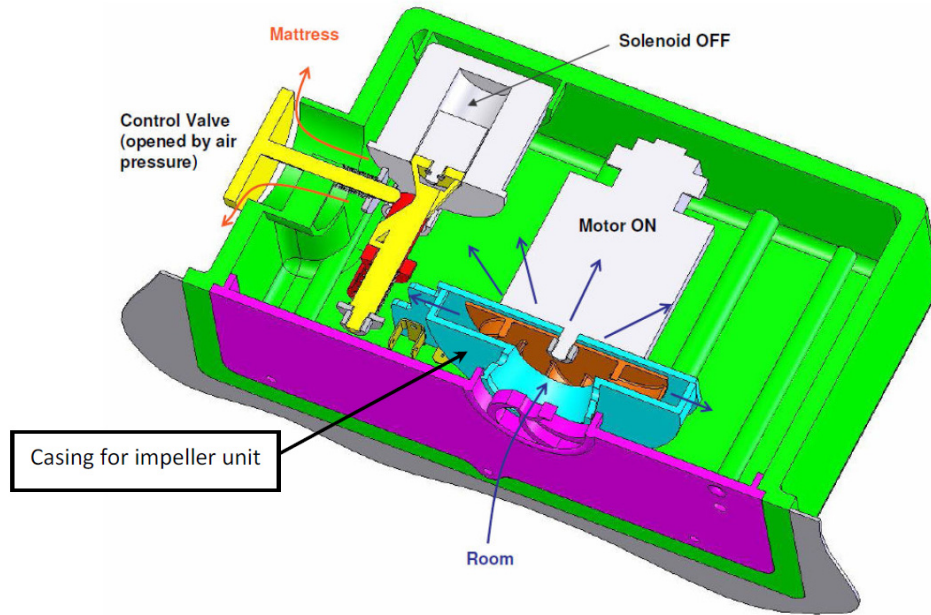
2. The District Court Misread and Misapplied this Court’s Law in Finding that the Accused Devices Did Not Have Both a Socket and a Pump Body

With respect to the claim requirement of “an electric pump, including a pump body and an air outlet, connected to the socket,” the district court rejected Intex’s assertion that the pump must have a housing around all its components in order to be a pump:

But neither the ’469 Patent claims nor its specification mention a housing with regard to the electric pump, which suggests that a housing should not be construed to be a necessary element of the pump body

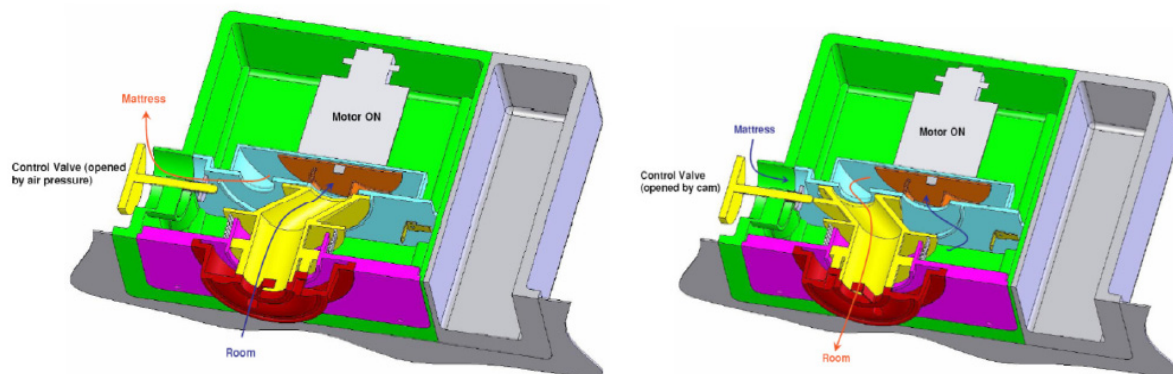
[A32, *see also* A32-36] Indeed, this squares with the common sense understanding that many kinds of pumps have only a rotating shaft connecting the drive motor with the pump casing and the spinning impeller inside the casing.

To that end, Team Worldwide’s summary judgment papers explained how the accused structures met this limitation. For example, in the Pump A variant shown below, air is drawn into the center of the light blue casing and expelled out the side of the casing by the orange impeller that is rotated by the gray motor.



[A2198-2201; A2591-99; A2557-73] The other components, including the green socket and yellow valve, operate to block air from leaking out of the bed. [Id.]

The Pump B devices are slightly more complex, to allow air to be blown in or out by the pump. Again, air is drawn in the middle of the impeller casing and expelled at its edge, but the yellow cam/valve structure can rotate so that the exterior of the device is either connected to the middle of the casing (for inflating) or the edge (for deflating).



When the exterior of the bed communicates with the edge of the impeller casing, then the interior of the socket communicates with the middle of the casing, so that the pump draws air from inside the bed via the socket interior, and blows it outside the bed via the casing's edge.

Team Worldwide explained how the impeller casing (light blue) and impeller (orange), together with the motor (light gray), tube (yellow), cover plate (magenta) and knob (red), map to the pump of the claim, and how that pump engages the socket (green)—again, a plain and straightforward read on the accused devices. Yet the district court found this feature lacking as a matter of law because of its view that the green socket was instead part of a pump housing, and so there could be no “pump ... connected to the socket.” [A52-55]

The court erred in its holding for at least three fundamental reasons. First, it erred by supposing that the entire structure was a pump body (with the socket acting as a housing for the pump), and then asking whether that same pump would exist if the socket were taken away. The court inexplicably compounded this error in finding, “TWW points to no expert testimony or other evidence suggesting that a person of ordinary skill in the art would view the pump housing as something separate from the pump itself...” [A54]. But this finding ignored at least Team Worldwide's explicit citation to the '469 patent's intrinsic evidence that, “The socket 46 is a cylindrical housing.” [A2292; A109 (4:29-30)]. This statement in

the ‘469 patent would have informed a person of ordinary skill’s understanding and—as intrinsic evidence—is primary to the extrinsic evidence on which the district court erroneously relied. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (*en banc*) (“[T]he person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification.”).

Moreover, this Court has plainly explained that an infringement inquiry for an open-ended claim must proceed from the structures that the patentee identifies as mapping to the claim limitations. *E.g., Dow Chem. Co. v. Sumitomo Chem. Co.*, 257 F.3d 1364, 1380 (Fed. Cir. 2001) (district court erred by looking to first phase of an accused chemical process, when only the second phase was accused by the patentee). Applied here, the question is whether the components identified by Team Worldwide are a pump body—and they most certainly are. Indeed, Intex never countered Team Worldwide’s evidence on the point, because it focused (and it caused the district court to focus) solely on the additional overall structure, and whether that additional structure could be removed without causing that greater structure to “not work” anymore. [A53] But as can be seen from the figures above, the failure of that structure to “work” simply means that the beds will not both inflate and deflate properly. However, that is not a requirement of the claims, let alone a requirement of the need for a separate pump body and socket. The

structures identified by Team Worldwide are certainly a “pump, including a pump body and an air outlet.”

The district court’s second error was holding that every pump includes a housing separate and apart from the socket. [A53]. This holding was based on the court’s “expect[ation],” without any supporting evidence, that a “typical” pump would include a housing. *Id.*; *see also* A35. The Court then proceeded from this unsupported “expectation” that some pumps require housings, to the importation of a requirement that *all* pumps include a housing (i.e., finding “there is no genuine question that the pump housing in the accused devices would be viewed as part of the pump itself”). [A54]. This ruling compounds multiple errors of law: importing an unnecessary limitation, importing that limitation from thin air, and ignoring that claim elements may be claimed separately. It is error to import unnecessary claim limitations from a specification. *Phillips*, 415 F.3d at 1323. It is further error to import unnecessary claim limitations that are unsupported. *See, e.g., Phillips*, 415 F.3d at 1318 (“[C]onclusory, unsupported assertions by experts as to the definition of a claim term are not useful to a court. Similarly, a court should discount any expert testimony ‘that is clearly at odds with the claim construction mandated by the claims themselves, the written description, and the prosecution history, in other words, with the written record of the patent.’”). And it is error to ignore the basic premise that claim elements may be (and usually are) claimed separately; indeed,

this Court has recognized that a housing may be claimed separately (whether denominated as a housing or a “socket”). *See, e.g., TIP Sys., LLC v. Phillips & Brooks/Gladwin, Inc.*, 529 F.3d 1364, 1377 (Fed. Cir. 2008) (“The housing is a separately claimed element...”). Thus, the district court erred in finding that the claimed pump requires a housing separate from the “socket” when the socket can be made with the housing.

The district court’s third error on this point was holding that, “if the housing in Intex’s devices is part of the electric pump, the housing cannot also satisfy the separate claim limitation of a socket”—something it considered to be the “general rule.” [A53] The district court was simply wrong on the law. The “general rule” is, instead, that:

An apparatus claim describing a combination of components does not require that the function of each be performed by a separate structure in the apparatus.

Sun Studs, Inc. v. ATA Equipment Leasing, Inc., 872 F.2d 978, 989 (Fed. Cir. 1989); *Hughes Aircraft Co. v. United States*, 717 F.2d 1351, 1364 (Fed. Cir. 1983); *see also Magrath v. Draper Corp.*, 384 F.2d 672, 673 (1st Cir. 1967). The district court cited *Becton, Dickinson & Co. v. Tyco Healthcare Group*, 616 F.3d 1249, 1254 (Fed. Cir. 2010) for its proposition, but that case and the cases it cites simply mean that two elements cannot be “one and the same” in an accused structure, but not that a unitary structure cannot have different portions that separately act as the

two claim elements. *Id.* (citing *Engel Indus., Inc. v. Lockformer Co.*, 96 F.3d 1398, 1404-05 (Fed. Cir. 1996)). Here, in contrast, the role of the socket is fully carried out by the rim of the green component in the figures above (*see, e.g.*, the socket 24 in the First Embodiment, which is simply a ring of material through which the pump 20 is inserted). The remaining portions of the green structure would then perform the alleged role of the pump housing urged by Intex. The roles of those portions of the structure are separate and distinct, and infringement cannot be avoided by simply making them part of one piece of plastic, even under the district court's improper approach of requiring that the housing be part of the pump body.

B. Doctrine of Equivalents

The district court found no infringement under the doctrine of equivalents by extending its reasoning above to find vitiation, and by criticizing Team Worldwide's expert evidence. Neither point is valid.

First, we explain above the problems with the district court's analysis that finds a limitation missing—i.e., (a) it never asked whether the casing, impeller, and motor constituted a pump, apart from whether the bi-directional pump created from the housing would also be considered a pump; and (b) it improperly believed that non-infringement results if portions two claim limitations are combined into one structure, when *Sun Studs* and its progeny say otherwise.

As for the expert evidence, this Court requires explanation of the insubstantiality of the differences between a claim element and accused structure—typically, but not necessarily, discussing the function, way, and result in which they operate. Team Worldwide provided that from Dr. Dubowsky:

[T]he [housing] in the accused products performs substantially the same function as the socket recited in the claims and as construed by the Court (i.e., allowing the pump to be disposed wholly or partially inside the inflatable body, and yet be detachable if necessary, such as for servicing, cleaning, inspection or otherwise); in substantially the same way (i.e., by providing a compartment inside the flexible inflatable element that fits and holds the pump, so that the two are detachably connected to each other); to achieve substantially the same result (i.e., allowing the electric pump to stably pump the inflatable body without being held manually, providing a configuration that is compatible with conventional bedding and bed frames, and allowing for a more compact configuration that is functionally and aesthetically appealing, and yet be detachable if desired or necessary.)

[A2197-98] This identification of similar functions, ways, and results is all the Court has required to establish substantial evidence. *Toro Co. v. White Consol. Indus., Inc.*, 266 F.3d 1367, 1371 (Fed. Cir. 2001) (vacating summary judgment of non-infringement where jury could find two-piece structure was insubstantially different from claimed one-piece claim element); *Lifescan, Inc. v. Home Diagnostics, Inc.*, 76 F.3d 358 (Fed. Cir. 1996) (finding substantial evidence from function/way/result evidence). Yet Team Worldwide also supplied additional arguments and facts in its briefing to support a finding of infringement under the doctrine of equivalents. While the district court complained that “Dr. Dubowsky

gives no explanation of how he arrived at his conclusions,” even to the extent such criticism may lessen the weight of the evidence, the district court cannot weigh evidence on summary judgment. Rather, Dr. Dubowsky’s testimony certainly meets the minimum “substantial evidence” requirements set forth by this Court by identifying the similarities in the function, way, and result of the claimed feature and the accused component. *Toro*, 266 F.3d at 1371; *Lifescan*, 76 F.3d at 362; *Applied Med. Resources Corp. v. U.S. Surgical Corp.*, 448 F.3d 1324, 1335 n.5 (Fed. Cir. 2006) (noting that declaration that addressed function, way, and result was sufficient). Based on such evidence, a jury must be tasked with making the ultimate determination on infringement; it is outside of the district court’s providence to make factual findings against non-movant Team Worldwide. Additionally, the district court reversibly erred in failing to identify the function, way and result that it believed was proper and supported summary judgment. *See, e.g., Conroy v. Reebok, Int’l.*, 14 F.3d 1570, 1576-77 (Fed. Cir. 1994) (remanding case where district court did not properly evaluate the permissible scope of the claims when granting summary judgment of non-infringement under the doctrine of equivalents); *see also Insituform Techs., Inc. v. Cat Contr., Inc.*, 161 F.3d 688, 693-94 (Fed. Cir. 1998) (reversing erroneous findings as to the proper function, way, and result). Instead, the district court summarily found facts against non-movant Team Worldwide and found the absence of infringement under the

doctrine of equivalents. Again, the district court's weighing of evidence is wrong as a matter of law, and requires vacating the judgment even if the Court agrees with its other rulings.

IV. Summary Judgment Should be Vacated if the Supreme Court Changes the Claim Construction Standard of Review in *Teva*

The district court here started its claim construction analysis by stating that it owed no deference to Magistrate Judge Robinson, even though it was working under a “clear error” standard of review, because claim construction is a legal issue reviewed *de novo*. However, that issue is under review by the Supreme Court in *Teva Pharms. USA, Inc. v. Sandoz, Inc.*, 723 F.3d 1363, 1373 (Fed. Cir. 2013), *cert. granted*, 82 USLW 3469 (Mar. 31, 2014). Applied here, the different standard would have required the district court to give due weight to Magistrate Judge Robinson's findings that the embodiments in the specification do not limit the definition, that the use of the term “detachably connected” in the ‘760 patent would have been given real weight in construing the terms of the ‘469 patent, and that the ordinary meaning of the term was “an opening or hollow that forms a holder for something.” [A11-12]

CONCLUSION

For the reasons discussed above, the district court's summary judgment of non-infringement should be vacated, and the case remanded for trial under an appropriate claim construction.

August 4, 2014

/s/ John Dragseth

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Counsel for Defendant Appellant

CERTIFICATE OF SERVICE

I certify that I electronically filed the foregoing with the Clerk of the Court for the United States Court of Appeals for the Federal Circuit by using the appellate CM/ECF system on August 4, 2014.

CORRECTED OPENING BRIEF FOR TEAM WORLDWIDE

I further certify that counsel of record are registered as CM/ECF users and will be served by the appellate CM/ECF system and via email.

August 4, 2014

/s/ John Dragseth

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Counsel for Defendant/Counterclaim-
Plaintiff/Appellant.

CERTIFICATE OF COMPLIANCE

The Brief for Defendant-Appellant complies with the type-volume limitation set forth in FRAP 32(a)(7)(B). The relevant portions of the Responsive Brief, including all footnotes, contain 11,235 words, as determined by Microsoft Word® 2013.

August 4, 2014

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Plaintiff/Appellant.

ADDENDUM

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UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

_____)	
INTEX RECREATION CORPORATION,)	
)	
Plaintiff/Counterclaim-Defendant,)	
)	
v.)	Civil Action No. 04-1785 (PLF)
)	
TEAM WORLDWIDE CORPORATION,)	
)	
Defendant/Counterclaim-Plaintiff.)	
_____)	

FINAL ORDER AND JUDGMENT

In light of the Court's September 30, 2005 Order dismissing plaintiff Intex Recreation Corporation's ("Intex") third claim for relief, and the Court's March 10, 2014 Order granting summary judgment to Intex on Intex's first claim for relief and denying summary judgment on counter-claim plaintiff Team Worldwide Corporation's ("TWW") sole claim for relief, and upon consideration of Intex's unopposed motion to dismiss without prejudice its second claim for relief, it is hereby

ORDERED that [228] Intex's unopposed motion to dismiss its second claim for relief (regarding patent invalidity) is GRANTED; it is

FURTHER ORDERED that Intex's second claim for relief, regarding the validity of U.S. Patent No. 6,793,469 B2, is DISMISSED WITHOUT PREJUDICE to Intex's re-presenting the claim following the disposition of any appeal in this case; and it is

FURTHER ORDERED that judgment is entered for Intex with respect to Intex's first claim for relief and TWW's sole claim for relief. The Clerk of the Court shall remove this case from the docket of this Court. This is a final appealable order. See FED. R. APP. P. 4(a).

SO ORDERED.

DATE: April 2, 2014

/s/_____
PAUL L. FRIEDMAN
United States District Judge

UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

_____)	
INTEX RECREATION CORPORATION,)	
)	
Plaintiff/Counterclaim-Defendant,)	
)	
v.)	Civil Action No. 04-1785 (PLF)
)	
TEAM WORLDWIDE CORPORATION,)	
)	
Defendant/Counterclaim-Plaintiff.)	
_____)	

ORDER

For the reasons set forth in the accompanying Opinion, it is hereby

ORDERED that [212] plaintiff Intex Recreation Corporation's ("Intex") Motion for Summary Judgment of Non-Infringement is GRANTED; it is

FURTHER ORDERED that [211] defendant Team Worldwide Corporation's Motion for Summary Judgment of Infringement is DENIED; it is

FURTHER ORDERED that judgment is entered for Intex on Claim I of Intex's Amended Complaint; it is

FURTHER ORDERED that judgment is entered for Intex on Claim I of Team Worldwide Corporation's Counterclaim; it is

FURTHER ORDERED that the Court DECLARES that Intex's products containing or incorporating pumps with pump model numbers 619RW and 619RL and pumps of like structure DO NOT INFRINGE Claims 14 through 17 of U.S. Patent No. 6,793,469 B2; it is

FURTHER ORDERED that the Court DECLARES that Intex's products containing or incorporating pumps with pump model numbers AP619, 639, and 626R and pumps

of like structure DO NOT INFRINGE Claims 14 through 17 of U.S. Patent No. 6,793,469 B2;
and it is

FURTHER ORDERED that on or before March 28, 2014, Intex shall show cause
as to why Claim II (patent invalidity) of Intex's Amended Complaint should not be dismissed for
lack of subject-matter jurisdiction.

SO ORDERED.

DATE: March 10, 2014

/s/ _____
PAUL L. FRIEDMAN
United States District Judge

UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

INTEX RECREATION CORPORATION,)	
)	
Plaintiff/Counterclaim-Defendant,)	
)	
v.)	Civil Action No. 04-1785 (PLF)
)	
TEAM WORLDWIDE CORPORATION,)	
)	
Defendant/Counterclaim-Plaintiff.)	

OPINION AND ORDER

This matter is before the Court on plaintiff's objections to Magistrate Judge Deborah Robinson's claim construction decision. Plaintiff Intex Recreation Corporation asserts that Judge Robinson misconstrued the terms "socket" and "pump body", as used in the air mattress patent owned by defendant Team Worldwide Corporation. After careful consideration of the arguments made in the parties' papers and at oral argument, the relevant legal authorities, and the entire record in this case, the Court sets aside in part and adopts in part Judge Robinson's decision.¹ The Court sustains plaintiff's objection to Judge Robinson's construction of "socket"

¹ The papers reviewed in connection with the pending motion include the following: plaintiff's amended complaint ("Am. Compl.") [Dkt. No. 4]; defendant's answer to plaintiff's complaint and counterclaim ("TWW Answer and Counterclaim") [Dkt. No. 10]; United States Patent No. 6,703,469 B2 ("the '469 Patent") [Dkt. No. 10-1]; plaintiff's answer to defendant's counterclaim ("Intex Answer") [Dkt. 15]; Opinion and Order granting in part and denying in part defendant's motion to dismiss, Intex Recreation Corp. v. Team Worldwide Corp., 390 F. Supp. 2d 21 (D.D.C. 2005) ("Intex I"); June 30, 2006 Referral Order ("Referral Order") [Dkt. No. 68]; defendant's memorandum in support of its first motion for claim construction and partial summary judgment ("TWW Mot. Claim Constr. and Part. Summ. J.") [Dkt. No. 102-2]; defendant's memorandum in support of its second motion for claim construction ("TWW's Claim Constr. Mot.") [Dkt. No. 140-3]; Forman Declaration, attached as Exhibit 1 to defendant's second motion for claim construction ("Forman Decl.") [Dkt. No. 140-1]; plaintiff's claim construction brief ("Intex's Claim Constr. Br.") [Dkt. No. 141]; Ruddy Declaration, attached as

and accepts the alternative construction proposed by plaintiff. The Court overrules plaintiff's objection regarding the term "pump body" and will adopt Judge Robinson's construction of that term, with a slight modification.

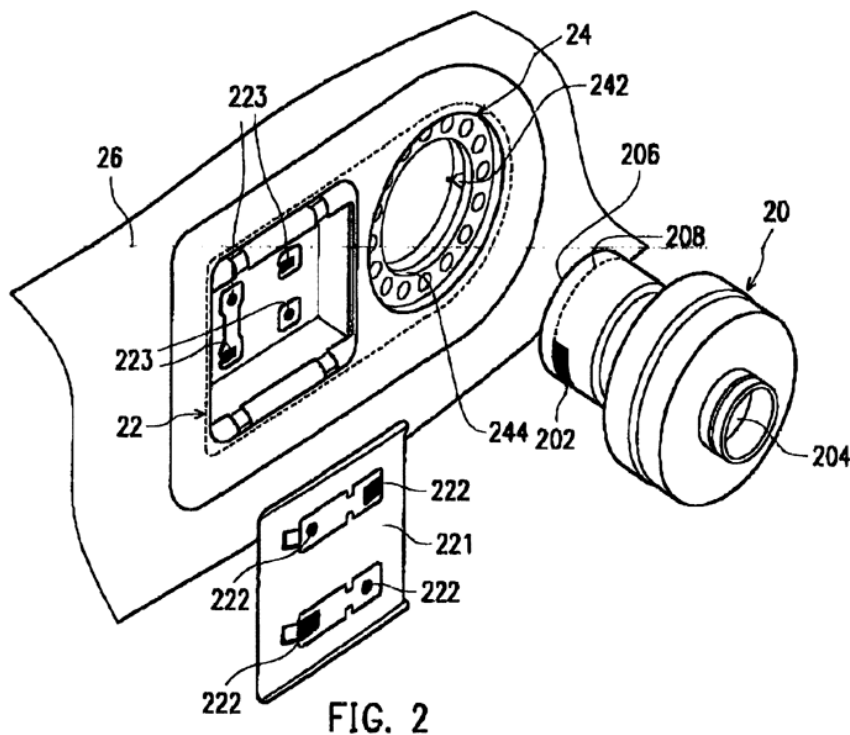
I. INTRODUCTION

This case involves a dispute between two manufacturers of air mattresses of the sort used in homes and on camping trips. Plaintiff Intex Recreation Corporation ("Intex") and defendant Team Worldwide Corporation ("TWW") disagree as to the scope of United States Patent No. 6,703,469 B2 ("the '469 Patent"), currently owned by TWW. See U.S. Patent No. 6,703,469 B2 (filed December 18, 2000). The invention claimed by the '469 Patent is an air mattress comprised of an inflatable body, a socket, an electric pump that includes a pump body and an air outlet, and a battery case. See '469 Patent col.1 ll.30-35 (Summary of the Invention); id. at col.7 ll.24-35, col.8 ll.24 – col.9 ll.60 (Claims).

TWW notes that unlike prior designs of air mattresses, which were inflated by electric pumps located on the outside of the inflatable body, this product could be inflated by inserting the pump body "partially or wholly" into a socket located *within* the inflatable body of the mattress, thus permitting a user to inflate or deflate the mattress without having to manually hold the electric pump in place. See TWW Claim Constr. Mot. 3. Intex points out that the invention claimed under the '469 Patent departs from the prior art by enabling a user to inflate

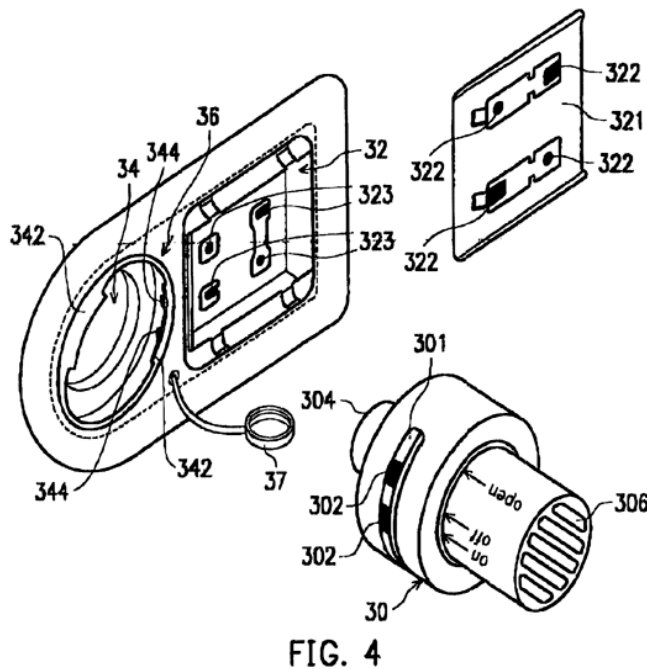
Exhibit 1 to plaintiff's claim construction brief ("Ruddy Decl.") [Dkt. No. 141-1]; Prosecution History of the '469 Patent, Forman Decl. Ex. B ("Pros. History") [Dkt. No. 140-6 *et seq.*]; the parties' joint statement of undisputed claim construction evidence ("Jt. Stmt") [Dkt. No. 142]; Magistrate Judge Robinson's Claim Construction Opinion and Order, Intex Recreation Corp. v. Team Worldwide Corp., 541 F. Supp. 2d 113 (D.D.C. 2008) ("Intex II"); plaintiff's objections to Magistrate Judge Robinson's Opinion and Order ("Intex Obj.") [Dkt. No. 147]; defendant's opposition to plaintiff's objections ("TWW Opp.") [Dkt. No. 156]; plaintiff's reply in support of its objections ("Intex Rep.") [Dkt. No. 160]; defendant's supplemental brief ("TWW Supp.") [Dkt. No. 184]; plaintiff's supplemental brief ("Intex Supp.") [Dkt. No. 186]; and the transcript of the June 9, 2011 hearing on plaintiff's objections ("Tr.") [Dkt. No. 206].

and deflate the mattress by changing the rotation of the electric pump. Intex Obj. 12-14. Figures 2 and 4 in the '469 Patent, which depict the first and second embodiments of the claimed invention, are reproduced below.²



'469 Patent, fig. 2 (depicting first embodiment).

² For ease of reference to the '469 Patent, the figures reproduced here are labeled using the same numbering as used in the patent specification.



'469 Patent, fig. 4 (depicting second embodiment).

II. PROCEDURAL HISTORY

Tony Wang, the inventor of the '469 Patent, and founder and president of TWW, submitted his application for this patent to the United States Patent and Trademark Office ("PTO") on December 18, 2000. '469 Patent at [22].³ Mr. Wang assigned the still-pending patent application to TWW on May 28, 2003. Pros. History at TWW000280. After an initial rejection of the application by the PTO and a series of amendments by Mr. Wang, the PTO approved the application, and issued the '469 Patent on September 21, 2004. '469 Patent at [45].

On October 8, 2004, shortly after obtaining the '469 Patent, TWW sent a cease-and-desist letter to Intex in which TWW alleged that Intex's sale of air mattresses with built-in

³ Mr. Wang's full name, as listed on the '469 patent, is Wang Cheng Chung. See TWW Claim Constr. Mot. at 2 n.1.

pumps infringed the '469 Patent. See TWW Answer and Counterclaim ¶ 7. In response, on October 14, 2004, Intex filed this civil action against TWW, seeking a declaration of non-infringement as to the '469 Patent and a declaration of its invalidity under 35 U.S.C. §§ 102 and 103. See Am. Compl.⁴ TWW, in its answer, denies that Intex is entitled to any relief, and has filed a counterclaim asserting that Intex has infringed and continues to infringe one or more claims of the '469 Patent. TWW Answer and Counterclaim. Both parties agree that a finding of infringement likely depends on whether or not this Court concludes that the air mattresses produced by Intex contain a “pump body” (or its equivalent) that is wholly or partially located in a “socket,” as those terms are used in the '469 Patent. TWW Mot. Claim Constr. and Part. Summ. J. 1, 10; Intex Obj. 18-19.

On June 30, 2006, with the consent of both parties, the undersigned referred this case pursuant to Rule 72 of the Federal Rules of Civil Procedure to Magistrate Judge Deborah Robinson “for management of all pre-trial matters, including for the purpose of issuing reports and recommendations on any dispositive motion.” Referral Order at 1.

On June 26 and June 29, 2007, Magistrate Judge Robinson conducted a two-day Markman hearing for the purpose of construing nine disputed claim terms in the '469 Patent. See Markman v. Westview Instruments, Inc., 517 U.S. 370 (1996). She subsequently issued a Memorandum Opinion and Order adopting two of the constructions proposed by Intex and seven of the constructions proposed by TWW. Intex II, 541 F. Supp. 2d at 121. Intex timely filed its objections to Magistrate Judge Robinson’s construction of the claim terms “socket” and “pump body”. TWW filed no objections to Magistrate Judge Robinson’s claim constructions. After the

⁴ The amended complaint also sought a declaration of the '469 Patent’s invalidity on the basis that TWW engaged in inequitable conduct in prosecuting its application for that patent. See Intex I, 390 F. Supp. 2d at 22. The Court dismissed Intex’s inequitable conduct claim on September 30, 2005. See id. at 26.

case was stayed pending the PTO's reexamination of the '469 Patent, the parties filed supplemental briefs and presented their arguments to this Court at a hearing on June 9, 2011.

III. LEGAL STANDARDS

A. Standard of Review

TWW contends that 28 U.S.C. § 636(c) deprives this Court of authority to review Magistrate Judge Robinson's decision, as the parties agreed to refer all pre-trial proceedings to Judge Robinson. TWW Supp. 2-3; see 28 U.S.C. § 636(c) (permitting direct appeal of any judgment issued by magistrate judge to relevant court of appeals, where parties have consented to such referral); FED. R. CIV. P. 73 (same). But reference to 28 U.S.C. § 636(c) and the corresponding Federal Rule of Civil Procedure – Rule 73 – is inappropriate here. In their joint report to this Court, the parties expressly confined their consent to a referral pursuant to Rule 72, see June 29, 2006 Joint Report at 1 (Dkt. No. 64), which permits review by the district court judge of orders issued by the magistrate judge. FED. R. CIV. P. 72(a); see LOC. CIV. R. 72.2(c). The parties expressly refrained from consenting to a referral under Rule 73. June 29, 2006 Joint Report at 1; see Fed. R. Civ. P. 73(c). In its Referral Order, the Court made clear that this was a Rule 72 referral, specifically advising the parties that if they wanted to broaden the referral to be one under Rule 73 – “thereby securing the opportunity to appeal any judgment directly to the court of appeals” – they should file a consent form “setting forth such an election.” Referral Order at 1. No such consent form was ever filed.

When a party objects under Rule 72 to a magistrate judge's determination with respect to a non-dispositive matter, the Court must modify or set aside all or part of the magistrate judge's order if it is “clearly erroneous” or “contrary to law.” FED. R. CIV. P. 72(a); see also LOC. CIV. R. 72.2(c). The “clearly erroneous” standard “applies to factual findings and

discretionary decisions[.]” Am. Center for Civ. Justice v. Ambush, 794 F. Supp. 2d 123, 129 (D.D.C. 2011) (quoting Coleman v. Sterling, Civ. Action. No. 09-1595, 2011 WL 2005227, at *2 (S.D. Cal. May 23, 2011)). The clearly erroneous standard is met when, “although there is evidence to support [a determination], the reviewing court on the entire evidence is left with the definite and firm conviction that a mistake has been committed.” Id. (quoting Federal Savs. & Loan Ins. Corp. v. Commonwealth Land Title Ins. Co., 130 F.R.D. 507, 508 (D.D.C. 1990)).

“The ‘contrary to law’ standard, by contrast, permits *de novo* review of a magistrate judge’s legal conclusions.” Id. (citing First Am. Corp. v. Al-Nahyan, 2 F. Supp. 2d 58, 60 (D.D.C. 1998)).

Because “[t]he interpretation of patent claims is exclusively a question of law,” this Court’s review is *de novo*. In re Papst Licensing GmbH & Co. KG Litig., 670 F. Supp. 2d 16, 27 (D.D.C. 2009) (citing Markman v. Westview Instruments, Inc., 517 U.S. 370); see also Solvay S.A. v. Honeywell Int’l, Inc., 622 F.3d 1367, 1379 (Fed. Cir. 2010) (“Claim construction is a question of law, which we review *de novo*.”) (citing Cybor Corp v. FAS Techs., Inc., 138 F.3d 1448, 1456 (Fed. Cir. 1998) (*en banc*)). This *de novo* review includes any factual findings underlying the magistrate judge’s analysis of the claims. See Gillespie v. Dywidag Sys. Int’l, USA, 501 F.3d 1285, 1289 (Fed. Cir. 2007) (citing Cybor Corp v. FAS Techs., Inc., 138 F.3d at 1451).⁵

⁵ In issuing an Opinion and Order, rather than a Report and Recommendation, Magistrate Judge Robinson assumed that claim construction was a non-dispositive matter. Compare FED. R. CIV. P. 72(a) (providing that magistrate judge, when deciding a non-dispositive matter, should issue a “written order stating the decision”), with FED. R. CIV. P. 72(b)(1) (providing that magistrate judge must issue a report and recommendation for dispositive matters). As noted *supra* at 5, however, it is possible that claim construction will be dispositive of the underlying patent infringement claims. This provides an alternate basis for *de novo* review, as the Federal Rules of Civil Procedure require plenary review of decisions of magistrate judges on dispositive matters. FED. R. CIV. P. 72(b)(3); see also Von Holdt v. A-1 Tool Corp., 636 F. Supp. 2d 726, 729-30 (N.D. Ill. 2009) (reviewing magistrate judge’s report and recommendation on patent claim construction *de novo* because decision was likely dispositive to

B. Claim Construction Generally

The claims of a patent “particularly point[] out and distinctly claim[] the subject matter which the inventor . . . regards as his invention.” 35 U.S.C. § 112(b); see also HERBERT F. SCHWARTZ & ROBERT J. GOLDMAN, PATENT LAW AND PRACTICE 120 (6th ed. 2008). In other words, the claims “define what is protected, *i.e.*, what a patentee has the right to exclude the public from making, using, importing, offering for sale, or selling.” Gillespie v. Dywidag Sys. Int’l, USA, 501 F.3d at 1289 (citing Phillips v. AWH Corp., 415 F.3d 1303, 1312 (Fed. Cir. 2005) (*en banc*)). When construing disputed claim terms, the Court looks to the claim construction principles outlined in Phillips v. AWH Corp., 415 F.3d at 1311-24.

When construing the claims of a patent, a court generally must give claim terms “their ordinary and customary meaning” as those terms would have been understood by “a person of ordinary skill in the art in question at the time of the invention.” Phillips v. AWH Corp., 415 F.3d at 1312-13 (collecting cases).⁶ Of fundamental importance is the claim language itself. See id. at 1314. “In some cases, the ordinary meaning of claim language as understood by a person of skill in the art may be readily apparent even to lay judges, and claim construction in such cases involves little more than the application of the widely accepted meaning of commonly understood words.” Id. (citing Brown v. 3M, 265 F.3d 1349, 1352 (Fed. Cir. 2001)); see, e.g., Acumed LLC v. Stryker Corp., 483 F.3d 800, 805 (Fed. Cir. 2007) (construing the term “curved”).

underlying claims); Shuffle Master, Inc. v. Awada, 2:04-CV-0980, 2007 WL 4166109, at *1 (D. Nev. Nov. 16, 2007) (same).

⁶ The pertinent science at issue here is that of “pneumatics,” *i.e.*, “a branch of mechanics that deals with the mechanical properties of gases (as weight, pressure, elasticity).” WEBSTER’S THIRD NEW INT’L DICTIONARY 1746 (1993); see also id. (“pneumatic pump”: “an air-exhausting pump”).

When construing a disputed claim term, however, the Court should not confine its inquiry to the claim language, but rather should examine how a person of ordinary skill in the art would read the claim term “in the context of the entire patent, including the specification.”

Phillips v. AWH Corp., 415 F.3d at 1313. The specification must contain “a written description of the invention, and of the manner and process of making and using it,” in “full, clear, concise, and exact terms” 35 U.S.C. § 112(a). The specification “is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.” Phillips v. AWH Corp., 415 F.3d at 1315 (quoting Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed. Cir. 1996)). As the court explained in Phillips:

The importance of the specification in claim construction derives from its statutory role. The close kinship between the written description and the claims is enforced by the statutory requirement that the specification describe the claimed invention in “full, clear, concise, and exact terms.”

Phillips v. AWH Corp., 415 F.3d at 1316 (quoting 35 U.S.C. § 112, para. 1 (2000)).

“[A] court ‘should also consider the patent’s prosecution history, if it is in evidence.’” Phillips v. AWH Corp., 415 F.3d at 1317 (quoting Markman v. Westview Instruments, Inc., 52 F.3d at 980)). The prosecution history “consists of the complete record of the proceedings before the PTO and includes the prior art cited during the examination of the patent.” Id. Because the prosecution history involves “an ongoing negotiation between the PTO and the applicant . . . it often lacks the clarity of the specification and thus is less useful for claim construction purposes.” Id. (collecting cases). Nevertheless, the prosecution history can give insight into “how the PTO and the inventor understood the patent,” id., 415 F.3d at 1317 (citing Lemelson v. Gen. Mills, Inc., 968 F.2d 1202, 1206 (Fed. Cir. 1992)), and “whether the inventor

limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be.” Id. (citing Vitronics Corp. v. Conceptronic, Inc., 90 F.3d at 1582-83).

District courts also may consider the claim terms in light of extrinsic evidence, “which ‘consists of all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises.’” Phillips v. AWH Corp., 415 F.3d at 1317 (quoting Markman v. Westview Instruments, Inc., 52 F.3d at 980). The Federal Circuit has cautioned district courts, however, against relying too heavily on extrinsic evidence, noting that it is “in general . . . less reliable than the patent and its prosecution history in determining how to read claim terms,” as it is often possible for the parties to develop extrinsic evidence that obscures the true meaning of the claim terms, as understood by a person of ordinary skill in the relevant art. Id. at 1318-19. Thus, where the meaning of a claim term is clear “from the intrinsic evidence alone, it is improper to rely on extrinsic evidence other than that used to ascertain the ordinary meaning of the claim limitation.” Bell Atl. Network Servs., Inc. v. Covad Commc’ns Grp., Inc., 262 F.3d 1258, 1268-69 (Fed. Cir. 2001).

A court must construe the claims “in light of the claim language . . . not in light of the accused device.” Cohesive Techs., Inc. v. Waters Corp., 543 F.3d 1351, 1367 (Fed. Cir. 2008) (citing Exigent Tech., Inc. v. Atrana Solutions, Inc., 442 F.3d 1301, 1310 n.10 (Fed. Cir. 2006)). Focusing on the accused device before interpreting the claims “would make infringement a matter of judicial whim.” In re Papst Licensing GmbH & Co. KG Litig., 670 F. Supp. 2d at 28 (quoting SRI Int’l v. Matsushita Elec. Corp. of America, 775 F.2d 1107, 1118 (Fed. Cir. 1985)). A court may consider the accused device, however, “when determining what aspect of the claim should be construed.” Cohesive Techs., Inc. v. Waters Corp., 543 F.3d at 1367.

IV. DISCUSSION

A. Claims 14-17 of the '469 Patent

The '469 Patent sets forth 17 claims, but only claims 14 through 17 are directly relevant to this patent infringement action. As the patent states:

What is claimed is

14. An inflatable product including:
an inflatable body;
a socket built in the inflatable body;
an electric pump, including a pump body and an air outlet,
connected to the socket to pump the inflatable body,
wherein the pump body is wholly or partially located in the
socket;
a connector provided on the electric pump for connecting an
external power to actuate the electric pump.

15. The inflatable product as claimed in claim **14**, wherein the
pump body can be received partially or wholly in the socket in the
first direction for inflating the inflatable body, and received in a
second direction for deflating the inflatable body.

16. An inflatable product including:
an inflatable body;
a socket built in the inflatable body;
an electric pump, including a pump body and an air outlet,
connected to the socket to pump the inflatable body,
wherein the pump body is wholly or partially located in tile
(sic) socket, a portion of the electric pump is inserted into
tile (sic) socket, and the portion of the electric pump and
the socket are matched with each other to prevent an air
leakage there between.

17. The inflatable product as claimed in claim **16**, wherein the
pump body can be received partially or wholly in the socket in a
first direction for inflating the inflatable body, and received in a
second direction for deflating the inflatable body.

'469 Patent col.8 ll.29-60 (emphasis added).

B. Socket

1. Magistrate Judge Robinson's Construction

In the claim construction proceedings before Magistrate Judge Robinson, TWW proposed that “socket” be construed as “an opening or hollow that forms a holder for something.” TWW Claim Constr. Mot. 1; see also Intex II, 541 F. Supp. 2d at 117. Intex urged Judge Robinson to adopt a narrower construction: “a structure that fits and holds onto an inserted part so that the structure and the part are detachably connected to each other.” Intex Claim Constr. Br. at 17; see also Intex II, 541 F. Supp. 2d at 116. After considering the parties' arguments, Judge Robinson agreed with TWW and adopted that the broader construction of socket as “an opening or hollow that forms a holder for something.” Intex II, 541 F. Supp. 2d at 118.

In doing so, Magistrate Judge Robinson relied on the approach articulated in Texas Digital Sys., Inc. v. Telegenix, Inc., 308 F.3d 1193 (Fed. Cir. 2002). See Intex II, 541 F. Supp. 2d at 115-16. In that case, the Federal Circuit encouraged district courts to consult with extrinsic sources such as dictionaries, instructing that “if more than one dictionary definition is consistent with the use of the words in the intrinsic record, the claim terms may be construed to encompass all such consistent meanings.” Texas Digital Sys., Inc. v. Telegenix, Inc., 308 F.3d at 1203 (citing Rexnord Corp. v. Laitram Corp., 274 F.3d 1336, 1343 (Fed. Cir. 2001)).

Applying this standard, Judge Robinson found that nothing in the intrinsic record narrowed the term “socket” from the broader definition put forth by TWW. Intex II, 541 F. Supp. 2d at 117-18. Although she found that the embodiments referring to sockets all contained detachable connections, she concluded that these embodiments could not be used to limit the claims. Id. In addition, she noted that in a related patent the term “detachably connected” was

used; the fact that the term “detachably connected” was not used in the ’469 Patent claims suggested to her that a permanent connection was possible. Id.

In Phillips, the Federal Circuit clarified that the principles outlined in Texas Digital should no longer guide a district court’s consideration of dictionary definitions. The court held that the methodology adopted in Texas Digital “placed too much reliance on extrinsic sources such as dictionaries . . . and too little on intrinsic sources, in particular the specification and prosecution history.” Phillips v. AWH Corp., 415 F.3d at 1320. As the Federal Circuit explained:

The main problem with elevating the dictionary to such prominence is that it focuses the inquiry on the abstract meaning of words rather than on the meaning of claim terms within the context of the patent. . . . [I]f the district court starts with the broad dictionary definition in every case and fails to fully appreciate how the specification implicitly limits that definition, the error will systematically cause the construction of the claim to be unduly expansive.

Phillips v. AWH Corp., 415 F.3d at 1321. Instead of “starting with a broad definition and whittling it down,” the Federal Circuit directed district courts to “instead focus[] at the outset on how the patentee used the claim term in the claims, specification, and prosecution history.” Id. While a judge remains free to consult a dictionary “at any time,” id. at 1322 (quoting Vitronics Corp. v. Conceptronic, Inc., 90 F.3d at 1585), the district court must focus on how the term is used in the patent documents. Id. at 1322-23.

After a careful review of the record in light of Phillips, and with particular attention to the patent claim language, its specification, and its prosecution history, the Court concludes that “socket” was erroneously construed by the magistrate judge, and instead should be construed in the narrower manner proposed by Intex. As discussed below, “socket” is

properly construed as “a structure that fits and holds onto an inserted part, so that the structure and the part are detachably connected to each other.”

2. The Language of the Claims

Neither party suggests that the term “socket” has a special meaning in the field of pneumatics. See generally Intex Obj.; see TWW Opp. 2 (“[T]his case involves common terms that describe a straightforward consumer product. The term[] ‘socket’ . . . [is] not arcane or highly technical.”). Each party proposes a plausible definition that generally is consistent with how the word “socket” is used in everyday life. Intex’s proposed construction of “a structure that fits and holds onto an inserted part, so that the structure and the part are detachably connected to each other,” is consistent with how the term typically is used when describing mechanical connections, such as a light bulb socket, or an electric socket. In these cases, a socket is part of a detachable connection that attaches to an insertable part. See, e.g., AM. HERITAGE COLL. DICTIONARY 1292 (3d ed. 1997), Ruddy Decl. Ex. J (defining socket as “[a]n opening or a cavity into which an inserted part is designed to fit: a light bulb socket”). But a socket has a broader meaning as well, and can refer to non-detachable connections; when describing a ball and socket joint, or an eye socket, for example, the definition of socket as “an opening or hollow that forms a holder for something” is more applicable. See WEBSTER’S NINTH NEW COLLEGIATE DICTIONARY 1119 (1991), Forman Decl. Ex. 3 (defining socket as “an opening or hollow that forms a holder for something, <an electric bulb~> <the eye~>”). The fact that this broader meaning is more appropriate in the context of anatomical connections perhaps weighs in favor of the narrower construction proposed by Intex, but either proposed construction can be said to comport with the plain language of the term.

The language of the claims thus does not resolve the matter. And the surrounding claim language sheds little light on how the term “socket” should be construed in the context of the ’469 Patent. It is clear from dependent claims 15 and 17 that the socket *can* form a detachable connection to the pump, since the claims specify that the pump may be removed from the socket, rotated, and reinserted in order to deflate the mattress. ’469 Patent, col. 8, ll.40-44, 56-60. But is detachability an essential characteristic of the socket described in independent claims 14 and 16? Claims 14 and 16 provide simply that the electric pump is “connected to the socket.” *Id.* col. 8, ll.34, 50. There is no indication from the language of claims 14 and 16 as to whether the connection is permanent or detachable.⁷

Thus, despite the parties’ best arguments, the Court finds that the claim language itself does not compel one construction of the term “socket” over the other. The rest of the specification and the patent’s prosecution history – to which the Federal Circuit in Phillips next directs the Court – are more helpful.

3. The Patent Specification and Prosecution History

Usually, the specification of the patent “is dispositive; it is the single best guide to the meaning of a disputed term.” Phillips v. AWH Corp., 415 F.3d at 1315 (quoting Vitronics

⁷ TWW invokes the principle of claim differentiation to argue that if certain dependent claims require detachability, the independent claims must not contain this requirement. TWW Opp. 39. Generally, the principle of claim differentiation provides that “the presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim.” Phillips v. AWH Corp., 415 F.3d at 1315 (citing Liebel-Flarsheim Co. v. Medrad, Inc., 358 F.3d 898, 910 (Fed. Cir. 2004)). Although the Court agrees with this basic principle, it is inapplicable here, as each of the dependent claims adds a new requirement that goes beyond simply requiring detachability. *See* ’469 Patent, col. 7, ll.52-55 (reciting claim 7, which requires that socket and pump be connected using threads and screws); *id.* col. 8, ll.40-44, 56-60 (reciting dependent claims 15 and 17, which add element of multi-directional pump).

Corp. v. Conceptronic, Inc., 90 F.3d at 1582). The specification of the '469 Patent contains a section entitled "Summary of the Invention," which describes the claimed invention as follows:

An object of the present invention is to provide a modified airbed, which is inflated and deflated in a different way from the conventional way mentioned above.

The airbed of the present invention includes an inflatable body, a socket, an electric pump and a battery case. The socket is built in the airbed. The electric pump is *detachably connected* to the socket to pump the airbed. The battery case is also built into the airbed for ease of loading batteries that supply the electric pump with power.

'469 Patent col.1 ll.30-35 (emphasis added).

This summary, which expressly characterizes the invention *as a whole* as having a detachable connection between the pump and socket, provides clear support for Intex's proposed claim construction. And "a statement in a specification that describes the invention *as a whole* can support a limiting construction of a claim term." Am. Piledriving Equip., Inc. v. Geoquip, Inc., 637 F.3d 1324, 1334 (Fed. Cir. 2011) (emphasis added) (citing C.R. Bard, Inc. v. U.S. Surgical Corp., 388 F.3d 858, 864 (Fed. Cir. 2004)); *see also* Nystrom v. TREX Co., Inc., 424 F.3d 1136, 1143 (Fed. Cir. 2005) (noting that the "Background of the Invention" section in the specification "frame[d] the invention in the context" of a disputed limitation); Microsoft Corp. v. Multi-Tech Sys., Inc., 357 F.3d 1340, 1348-49 (Fed. Cir. 2004) (giving weight to limitations described in the "Summary of the Invention" section). "That is especially true where . . . other statements and illustrations in the patent are consistent with the limiting description." Am. Piledriving Equip., Inc. v. Geoquip, Inc., 637 F.3d at 1334.

The relevant embodiments are consistent with this narrower definition of the term "socket." Ten embodiments are disclosed. *See* '469 Patent col.1 l.47 – col.7 l.11. Embodiments 1 through 7 are described as having "sockets," and in each of these embodiments, the term

“socket” appears to describe a structure that fits and holds onto the electric pump; the pump is “fitted into,” “fitted in,” “put in” or “screwed together” with the socket. ’469 Patent, col. 2 l.66, col. 3 ll.31-32, col. 4 l.44, col. 5 l.37, col. 6 l.22.⁸ Alongside a “Summary of the Invention” that describes the plug as detachably connected from the socket, these embodiments support Intex’s proposed construction.

TWW presents two arguments as to why the Court should not discern a limitation of detachability from embodiments 1 through 7. First, TWW points to embodiments 8 through 10, which refer to a fan and motor fitting either detachably *or permanently* into a chamber within the mattress. See ’469 Patent, col.6 ll.26-65 (describing how fans are received in chambers, and need not be removed for deflation); id. at col.7 ll.2-3 (describing tenth embodiment, in which “[t]he first and second fans and motors . . . are *permanently or detachably connected* to the airbed”) (emphasis added). According to TWW, these embodiments make clear that the term “socket” can refer to one end of a non-detachable connection. Second, even if embodiments 8 through 10 were disregarded and embodiments 1 through 7 were taken as the universe of ’469 Patent embodiments – as Intex advocates – TWW asserts that the claim term “socket” should not be limited to the disclosed embodiments.

Turning to TWW’s first argument, the Court observes that while embodiments 8 through 10 are included in the patent documents, there is a disconnect between the language used

⁸ Although the parties devote most of their attention to the question of detachability, the parties also dispute the fit-and-hold requirement in Intex’s proposed construction. TWW Opp. at 17-18. TWW asserts that the embodiments are inconsistent with any limitation requiring that the socket provide a fitting or gripping function. Pointing to the first embodiment, TWW refers to the O-ring which can be placed in either the socket or on the side of the pump in order to prevent air from leaking out of the mattress. Arguing that the socket does not contain a mechanism to create an airtight seal in the latter version of the embodiment, TWW argues that the embodiment is inconsistent with a fit-and-hold requirement. See TWW Opp. at 17. But a fit-and-hold limitation is different from a limitation requiring an airtight seal. The first embodiment simply suggests that the socket need not contain a mechanism to create an airtight seal.

in these embodiments and the language of the claims. While the '469 Patent refers to placing a “pump body” into a “socket,” the written descriptions provided for embodiments 8 through 10 refer to a “chamber” in which fans and motors can be housed. Despite this inconsistent terminology, however, TWW maintains that “the specification describes all ten examples as embodiments of Mr. Wang’s invention,” and that the term “socket” is equivalent to “chamber.” See TWW Opp. 5.

TWW’s argument might be persuasive if not for the prosecution history, which unequivocally demonstrates that embodiments 8 through 10 do not teach the claims in the '469 Patent. As discussed below, when Mr. Wang first filed the patent application for the '469 Patent, he included several claims that he later withdrew during the prosecution of the patent. See Pros. History at TWW000249-50 (letter withdrawing certain claims); id. at TWW000207-10 (showing original claims). But Mr. Wang never modified the embodiments that were described in his original application. Embodiments 8 through 10 teach claims that Mr. Wang abandoned prior to approval of the patent. They therefore are wholly irrelevant to construing the term “socket” in the '469 patent.

To explain further: The prosecution history shows that the original application contained 18 claims. Former claims 1 through 11, 17, and 18 each described an inflatable body containing a socket into which an electric pump could be inserted, and former claim 14 described a mode of inflating and deflating an inflatable product using an electric pump that contained a fan. Pros. History at TWW000207-10.

The original application also contained four claims that described a different mattress design. Former claims 12 and 13 recited a mattress that included an inflatable body, in which a “chamber” was located, “communicating the inside and the outside of the inflatable

body.” Pros. History at TWW000209. A fan was placed permanently in the chamber to channel air in and out of the inflatable body, and a motor – either permanently or detachably connected to the chamber – was used to rotate the fan in one direction to inflate the mattress and in another direction to deflate it. Id. at TWW000209. Neither former claim 12 nor 13 mentioned a socket or an electric pump. Id. at TWW000209.

The eighth and ninth embodiments, which were provided in Mr. Wang’s original application and which remain (inadvertently, it seems) in the final patent, appear to teach former claims 12 and 13. For example, the eighth embodiment is described as follows:

Referring to FIG. 13A [reproduced below], an airbed **80** of an eighth embodiment of the invention is provided a cover **85**, a chamber **84**, a fan **81** received in the chamber **84**, a motor **82** for rotating the fan **81**, a plurality of rechargeable batteries **88** for supplying the motor **82** with power, and a switch **83** for actuating the motor **82**. . . . The chamber **84** has a nozzle **841** communicating the chamber **84** and the outside of the airbed **80**, and a hole communicating the chamber **84** and the inside of the airbed **80**. In the inflating operation, the user pushes the switch **83** to actuate the motor **82** and fan **81**. Then, outside air is pumped into the airbed **80** through the nozzle **841** and the hole **842**. After the airbed **80** is filled with air, the user closes the nozzle with the cover **85** to prevent the airbed from leaking. Referring to FIG. 13B, in the deflating operation, the user takes away the cover **85** and pushes the switch **83** to rotate the motor **82** and fan **81** in reverse. Then, air inside the airbed **60** is pumped out.

In the eighth embodiment, the fan **81** is received in a chamber **84** and is driven by an outside motor **82**. However, it is understood that the fan and motor can be housed together to operate.

’469 Patent col.6 ll.25-49 (emphasis added).

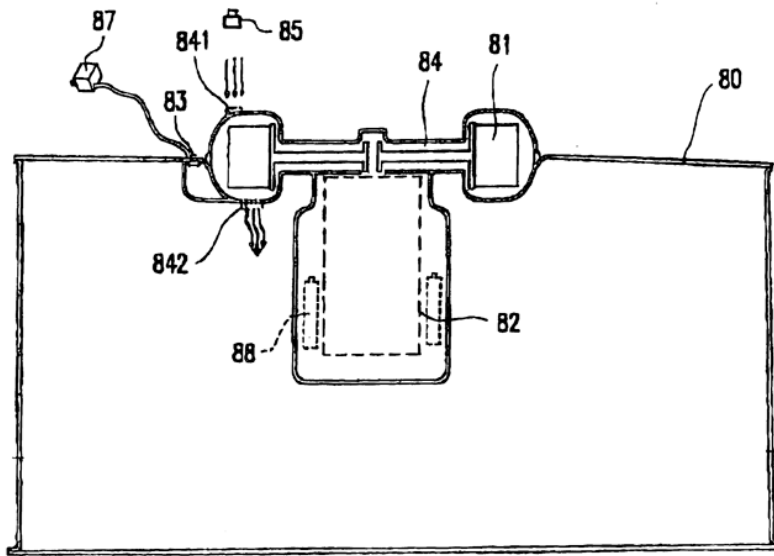


FIG. 13A

'469 Patent, fig. 13A (depicting eighth embodiment).

Former claims 15 and 16, also included in Mr. Wang's initial application, described another version of the mattress containing an inflatable body in which two electric pumps were housed: one pump for inflating the body and another for deflating it. Pros. History at TWW000210. These pumps could be either permanently or detachably connected to the inflatable body. *Id.* Neither former claim 15 nor former claim 16 referred to a socket. *Id.*

The tenth embodiment, provided in Mr. Wang's original application and present in the final patent document, teaches former claims 15 and 16. The description of the tenth embodiment is as follows:

Referring to FIG. 15 [reproduced below], in a tenth embodiment of the present invention, a first fan and motor **100** and a second fan and motor **200** are housed in different chambers. The first and second fans and motors **100**, **200** are permanently or detachably connected to the airbed (not shown). Furthermore, the motors **100** and **200** are actuated by rechargeable batteries (not shown) or by an external power (not shown) via a connector **150**. In the inflating operation, the first fan and motor **100** is actuated to

pump the airbed (not shown) while the second fan and motor **200** is at rest. In the deflating operation, the first fan and motor **100** is at rest while the second fan and motor **200** is actuated to pump air inside the airbed out.

'469 Patent col. 6 l.66 – col.7 ll.11 (emphasis added).

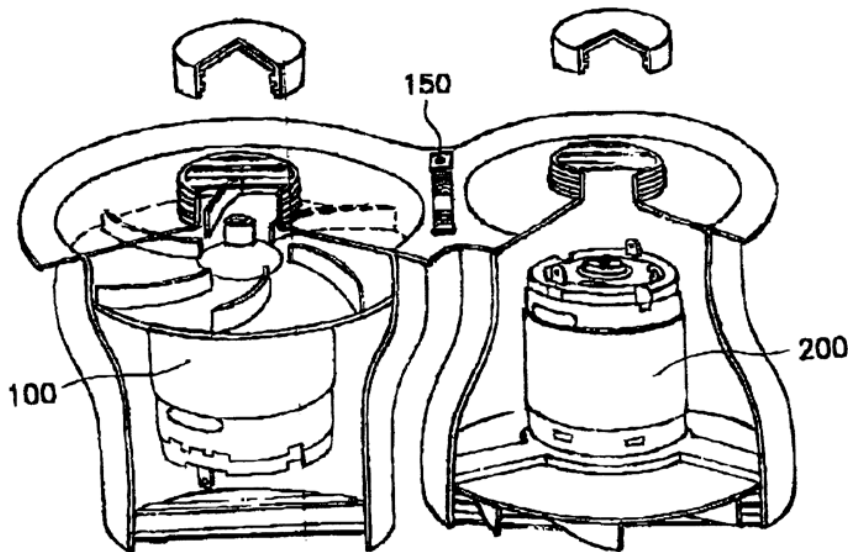


FIG. 15

'469 Patent, fig. 15 (depicting tenth embodiment).

On April 22, 2002, in response to his original application, the PTO notified Mr. Wang that it was imposing a “restriction requirement.” See Pros. History at TWW000244-48.⁹ The PTO had determined that Mr. Wang’s patent application actually referred to four distinct inventions: (I) the mode of inflation and deflation described in claim 14; (II) the inflatable product described in claims 1 through 11, 17 and 18; (III) the inflatable product described in

⁹ 35 U.S.C. § 121 provides that if “two or more independent and distinct inventions” are claimed within one patent application, the Director of the PTO may restrict the application to one of the inventions.

claims 12 and 13; and (IV) the inflatable product described in claims 15 and 16. See id. at TWW000246. In order to proceed forward, Mr. Wang would have to choose one category of claims to pursue in the present application and withdraw the others, with leave to pursue them in separate applications. See id. at TWW000246-47.¹⁰

In response, in December 2002, Mr. Wang notified the PTO that he elected to pursue claims 1 through 11, 17 and 18 from his original application, and he withdrew claims 12 and 13 (the single chamber claims), claim 14 (the mode of inflation and deflation), and claims 15 and 16 (the dual chamber claims). See Pros. History at TWW000249-50. On July 11, 2003, Mr. Wang resubmitted his patent application with only thirteen claims, all of which were contained in his original application, although some were renumbered. Id. at TWW000287-84. About one year later, on April 7, 2004, Mr. Wang submitted an amendment to his application, adding four dependent claims to the patent, bringing the total number of claims to 17. Id. at TWW000345. Absent from his 2003 application or 2004 amendments were former claims 12, 13, 15, and 16, *i.e.*, the claims describing fans and motors housed in one or more chambers.¹¹ But the descriptions of the embodiments that taught these claims – embodiments 8 through 10, and figures 13A through 15 – were present and unaltered in the final application.

The prosecution history thus clearly indicates that embodiments 8 through 10 do not teach the claims in the '469 Patent. Yet TWW points to these embodiments as reflecting the

¹⁰ In distinguishing between the different categories, the Examiner stated that the second category of claims corresponded to an invention that “inflates and deflates by reversing orientation of the motor,” while the third category described an invention that “reverses the direction of rotation of the motor.” See Pros. History at TWW000247. The fourth category corresponded to a product that “uses two motors, one for inflation and the other for deflation.” Id.

¹¹ Former claims 12 and 13 were pursued in Divisional Application No. 10/459,690. See Ruddy Decl., Ex. D, Prosecution History of Divisional Application No. 10/459,690, Supp. Jan. 10, 2005 Am. at 3 (January 10, 2005 supplemental amendment requesting that former claims 12 and 13 be included in divisional patent application).

'469 Patent claim terms. See TWW Opp. 5. This is plainly incorrect. Where a patent specification includes embodiments that reflect claims that were withdrawn from that patent application and pursued in another, the presence of those embodiments do not serve to broaden the scope of the patent. See Acco Brands, Inc. v. Micro Sec. Devices, Inc., 346 F.3d 1075, 1079 (Fed. Cir. 2003) ("The presence in the [patent's] specification of embodiments carried over from the parent application, but claimed in other patents, does not serve to broaden the scope of the [patent's] claims that were the subject of the divisional application."). This correlates to the "bedrock principle" of patent law that "'the *claims* of a patent define the invention to which the patentee is entitled the right to exclude.'" Phillips v. AWH Corp., 415 F.3d at 1312 (quoting Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc., 381 F.3d at 1115) (emphasis added).

TWW next argues that even if the Court finds that embodiments 8 through 10 do not teach the '469 patent claims (as the Court must), the limitation of a detachable, fit-and-hold connection should not be read into the claims simply because that feature appears in embodiments 1 through 7. TWW Opp. 2-3; 34-35. In other words, the fact that the relevant embodiments use the term socket in the context of a detachable connection does not mean that the term socket should be construed as implicitly requiring a detachable connection.

It is true that claims generally should not be confined to the disclosed embodiments, where no other intrinsic evidence supports the limitation. As the Federal Circuit noted in Phillips,

[A]lthough the specification often describes very specific embodiments of the invention, [the court] ha[s] repeatedly warned against confining the claims to those embodiments. . . . That is not just because section 112 of the Patent Act requires that the claims themselves set forth the limits of the patent grant, but also because persons of ordinary skill in the art rarely would confine their

definitions of terms to the exact representations depicted in the embodiments.

Phillips v. AWH Corp., 415 F.3d at 1323. And the '469 Patent itself notes that the claims are not intended to be coextensive with the embodiments disclosed. '469 Patent col.7 ll.14-22 (“While the invention has been described by way of example and in terms of the preferred embodiment, it is to be understood that the invention is not limited to the disclosed embodiments.”).

But Intex does not urge the Court to infer detachability simply because all of the relevant embodiments show a detachable connection (although they do). Rather, Intex argues that the Court should discern a detachability requirement from the manner in which Mr. Wang and TWW used the term socket throughout the prosecution of the patent, including in the description of the embodiments. See Intex Obj. 7, 12-14, 39-41.

As discussed *supra* at 17-22, TWW used the term “socket” in its description of embodiments 1 through 7, all of which have a detachable pump-socket connection. TWW used the term “chamber” when it recited former claims 12, 13, 15, and 16 or described embodiments of those claims, all of which require a connection that is permanent or has the option of being permanent. See Pros. History at TWW000209-10 (reciting former claims); '469 Patent col.6 ll.25-49 (describing eighth embodiment); '469 Patent col. 6 l.66 – col.7 ll.11 (describing tenth embodiment).¹²

Because Mr. Wang consistently used the term “socket” when describing embodiments with detachable connections, and consistently used the term “chamber” when describing embodiments with connections that had the option of being permanent, the Court concludes that the terms refer to distinct concepts. See Bell Atl. Network Servs., Inc. v. Covad

¹² Although former claims 15 and 16 do not use either the term “socket” or the term “chamber,” see Pros. History at TWW000210, the embodiment that teaches claims 15 and 16 – the tenth embodiment – uses the term “chamber” to describe in the opening in which the fans and motors are permanently or detachably placed. '469 Patent col. 6 l.66 – col.7 ll.11.

Commc'ns Grp., Inc., 262 F.3d at 1270 (giving narrower construction to claim term “mode” as distinct from “rate” where “patentees, throughout the specification, use the terms ‘rate’ and ‘mode’ to refer to separate and distinct concepts”).¹³ TWW’s proposed construction – “an opening or hollow that forms a holder for something” – would disregard this distinction, while Intex’s proposed construction – “a structure that fits and holds onto an inserted part, so that the structure and the part are detachably connected to each other” – preserves it.

In light of this prosecution history, the “Summary of the Invention” section discussed *supra* at 16, which explicitly states that the electric pump “is detachably connected to the socket,” ’469 Patent col. 1 l.32-33, and the patent documents as a whole in this case, it is clear that a person of ordinary skill in the art would understand the term “socket” in the context of a detachable connection.

4. Related claims

Finally, TWW argues that U.S. Patent Number 6,332,760 (“the ’760 Patent”) – a related patent – demonstrates that “socket” must be construed broadly to cover both permanent and detachable connections. TWW Opp. 37-38; see U.S. Patent Number 6,332,760 (filed Apr. 4, 2000); ’469 Patent at [63] (noting relationship to application that led to the ’760 Patent). Claims 1 and 8 of the ’760 Patent refer to a pump being “detachably connected” to a socket. ’760 Patent col.1 l.22; id. col.2 l.34. According to TWW, this proves that the term “socket” itself does not denote detachability – if it did, the term “detachably” in the ’760 Patent would be redundant. TWW Opp. 37.

The Court does not find this argument persuasive. The Federal Circuit has noted that where the specification and prosecution history indicate that a claim term should be read

¹³ At one point, when describing the ninth embodiment, Mr. Wang uses the term “housing” as synonymous with “chamber”. ’469 Patent col.6 l.66 – col.6 ll.47-65.

narrowly, the occasional use of a redundant modifier does not expand the scope of that term. See Nystrom v. TREX Co., Inc., 424 F.3d 1136, 1143-44 (Fed. Cir. 2005); Tandon Corp. v. United States Int’l Trade Comm’n, 831 F.2d 1017, 1023-24 (Fed. Cir. 1987) (finding that, in light of other intrinsic evidence, “the inclusion of the term ‘non-gimballed’ in claim 5 did not require that claims 1 and 12 be read to encompass a gimballled first transducer”). In Nystrom, the court considered whether the claim term “board” should be construed as requiring that it be made out of wood. The plaintiff patent-owner asserted that the term “board” in one claim should not be limited to conventional wood boards, in light of language in other claims referring to a “*wood decking board*.” Nystrom v. TREX Co., Inc., 424 F.3d at 1143 (emphasis added). The Federal Circuit rejected this argument. While noting that the use of different words or phrases – “board” at one place, “wood decking board” at another – usually implies a difference in meaning, the court went on to clarify that this principle should yield to other intrinsic evidence. Id. at 1143-46. In light of the fact that the claim language, the “Background of the Invention” section, and the prosecution history indicated that the term “board” should be read narrowly as composed of wood, the Federal Circuit gave little weight to the fact that this construction occasionally rendered the adjective “wood” redundant. Id.

Nystrom is instructive in this case. As in Nystrom, the general description of the invention, the specification as a whole, and the prosecution history indicate that the disputed claim term – here, “socket” – should be read narrowly, as necessarily part of a detachable connection. The fact that the claims of a related patent describe a socket as being “detachably connected” to a pump does not broaden the meaning of the term. See Tandon Corp. v. United States Int’l Trade Comm’n, 831 F.2d at 1024 (“[O]ne can not interpret a claim to be broader than what is contained in the specification and claims as filed.”).

5. Extrinsic Evidence

“[I]f the meaning of the claim limitation is apparent from the intrinsic evidence alone, it is improper to rely on extrinsic evidence other than that used to ascertain the ordinary meaning of the claim limitation.” Bell Atl. Network Servs., Inc. v. Covad Commc’ns Grp., Inc., 262 F.3d at 1268-69 (internal citation omitted). Because the Court finds that the intrinsic evidence, particularly the specification and the prosecution history of the patent, compels it to construe “socket” to mean “a structure that fits and holds onto an inserted part so that the structure and the part are detachably connected to each other,” it need not consider the expert testimony submitted by either party. See Vitronics Corp. v. Conceptronic, Inc., 90 F.3d at 1584 (“[W]here the patent documents are unambiguous, expert testimony regarding the meaning of a claim is entitled to no weight.”).

C. Pump Body

In the proceedings before Magistrate Judge Robinson, TWW proposed that the term “pump body” should be construed as the “main part of the pump.” TWW Claim Constr. Mot. 1. Intex proposed a more specific construction: “a housing that surrounds the other components of the pump.” Intex Claim Constr. Mot. 18. After considering the parties’ arguments, Magistrate Judge Robinson construed the term “pump body” in the manner proposed by TWW. Intex II, 541 F. Supp. 2d at 118 (finding that TWW’s construction was “consistent with the law governing claims construction,” and concluding that “the ordinary meaning to a person skilled in the art of pumps, would consider pump body to mean the main part of the pump.”)

In its objections to Magistrate Judge Robinson’s opinion, Intex again asserts that “pump body” should be construed as “a housing that surrounds the other components of the

pump.” Intex Obj. 2. Intex has requested, however, that if the Court chooses to affirm Judge Robinson’s construction, it should clarify that the “main part of the pump” must include a pump housing. Intex Obj. 27; see also Tr. 19:18-20:1 (“[W]e’re saying that the pump body, whatever else it is, it includes the housing that surrounds the other components of the pump . . . TWW, in this case, should not be able to frame arguments that the pump body does not include that housing.”). TWW maintains that the construction “main part of the pump,” without further limitation or clarification, is most appropriate.

1. Pump Body: “Main Part of Pump” or “Pump Housing”?

As with their arguments regarding “socket”, neither party suggests that the term “pump body” has a specific technical meaning in the field of pneumatics. See TWW Opp. 2, 26; see generally Intex Obj. And again, both parties provide plausible definitions that comport with everyday usage of the term “body”. Compare TWW Opp. 26 (citing AM. HERITAGE DICTIONARY OF THE ENGLISH LANGUAGE (2000), for definition of “body” as “[t]he main or central part”), with Intex Obj. 28 (noting that “‘auto body’ is the shell or housing that surrounds an automobile”).

Upon review of the parties’ papers and the patent documents, the Court concludes that the term “pump body” refers broadly to “the main part of the pump,” to be distinguished from the air outlet, and is not confined to the housing surrounding other parts of the pump.

The Court begins its analysis, of course, with the language of the claims. Disputed claims 14 and 16 recite “an electric pump, including a pump body and an air outlet,” and require that the “the pump body is wholly or partially located in the socket.” ’469 Patent col.8 ll.33-35, 49-52. Claims 15 and 17 specify that in the claimed invention, “the *pump body* can be received partially or wholly in the socket in a first direction for inflating the inflatable body, and received in a second direction for deflating the inflatable body.” Id. col.8 ll.40-43,

57-59 (emphasis added). Absent from the claims is any discussion of what comprises the pump body; nor is there any discussion of a pump housing.

The meaning of the term “pump body” is not immediately clear from the claim language, although two inferences can be made: first, the term “pump body” describes only part of the electric pump; and second, the air outlet is distinct from the pump body. The fact that the pump body and the air outlet are the only elements specified as comprising the electric pump arguably implies that the pump body consists of everything in the electric pump except the air outlet.

The '469 Patent specification provides little guidance. This specification is devoid of details about the pump body or pump housing, and the disclosed embodiments are consistent with each party's proposed construction. In the first embodiment, depicted by figure 2, *supra* at 3, a large portion of the electric pump's housing, but not the portion containing the inner workings of the pump, is inserted into the socket. In the second embodiment, shown at figure 4, *supra* at 4, most of the pump, including the fan and motor surrounded by a housing, is inserted into the socket. Because the pump body must be “wholly or partially located in the socket” to fall within the scope of the patent claims, these embodiments indicate that the “pump body” is not limited to the fan, motor, or other inner workings of the pump. But these embodiments, and the others disclosed in the specification, do not clearly favor either party's construction.

Fortunately, the prosecution history again is particularly helpful in clarifying the meaning of this disputed term. When Mr. Wang submitted his patent application, the claims that later became claims 14 and 16 recited “an electric pump connected to the socket to pump the inflatable body.” See Pros. History at TWW000208-10 (showing former claims 11 and 18,

which became claims 14 and 16, respectively); id. at TWW000289-90. These claims in Mr. Wang's application were rejected as obvious and anticipated by the prior art, which included devices where the mattress was inflated by inserting the air outlet of an electric pump into a socket in the inflatable body, while the rest of the electric pump remained outside of the inflatable body. See id. at TWW000257, TWW000260, TWW000263. Mr. Wang amended his claim to clarify that the claimed invention contained an electric pump that included "a pump body and an air outlet," and that the pump body was "wholly or partially located in the socket." Id. at TWW000289-90; TWW000292. In other words, the term "pump body" functioned to clarify that a device would not fall within the scope of the '469 Patent claims if the electric pump remained *outside* the inflatable body, and connected to the socket only via an air outlet. This prosecution history makes clear that the term "pump body" was not intended to refer to the housing of the pump – or any specific part of the pump – but rather refers broadly to the "main part of the pump."¹⁴

The construction proposed by TWW and adopted by Magistrate Judge Robinson was confirmed by a recent decision issued by the PTO. When reviewing the '469 Patent during an *ex parte* reexamination proceeding, the PTO noted that the language of the independent claims, which recite "an electric pump, including a pump body and an air outlet," would lead "persons of ordinary skill in the art . . . [to] recognize that the pump has two parts: a body and an air outlet." Ex parte Team Worldwide Corporation, No. 2010-2223, at *6 (B.P.A.I. July 22, 2010), (Dkt. No. 184-1). After noting that the specifications were consistent with the

¹⁴ Intex points to one document in the prosecution history, in which Mr. Wang referred to an electric pump as having a "pump body (i.e., inflator housing)." See Pros. History at TWW000292. Intex argues that the use of "i.e." shows that the housing and pump body were viewed as synonymous. In light of the document as a whole, however, the Court finds that a more natural interpretation is that Mr. Wang was simply referring to the housing of the inflator as *part* of the pump body, and distinguishing it from the air outlet, the only other labeled element in that drawing.

construction of “main part of the pump,” the PTO construed the term “pump body” substantially in accordance with Magistrate Judge Robinson’s construction, defining it as “the main part of the electric pump and to be a separate and distinct element from the air outlet.” Id. at *7; see also Tr. 27:14-18.

The plain language of the claims, the prosecution history, and the findings of the PTO all lead the Court to conclude that the term “pump body” refers to the main part of the electric pump, as distinct from the air outlet.

2. Whether Housing is a Required Element of the Pump Body

Perhaps recognizing the weakness of its initial argument, Intex presses an alternative construction for “pump body” in its objections. It now asserts that “an equally valid . . . alternative construction would be ‘the main part of the electric pump, including the housing, and to be a separate and distinct element from the air outlet.’” Intex Supp. 6; see also Intex Obj. 11; Tr. 19:18-20:1; id. 21:13-16; id. 25:8-11. In other words, Intex asks the Court to construe the term “pump body” as necessarily including a pump housing. TWW, for its part, objects to any implication that a pump body must have a housing, and asserts that reading this limitation into the claims is inappropriate and unsupported by the record. TWW Opp. 12, 31-32.

All of the disclosed embodiments contain pumps surrounded by a housing. And because the Court finds that the claims require a pump that is detachably connected to a socket, *supra* at 25-27, the Court would expect that the typical electric pump designed in accordance with the ’469 patent would contain a housing to cover the fan and motor. TWW itself concedes that “in certain embodiments, there may be a pump housing and, in certain embodiments, the housing may be a part of the main part of the pump.” TWW Opp. 32.

But neither the '469 Patent claims nor its specification mention housing with regard to the electric pump, which suggests that a housing should not be construed to be a necessary element of the pump body. And the Court may not read a limitation from the embodiments into the claims, where there is no other evidence in the patent documents that such a limitation was intended. Phillips v. AWH Corp., 415 F.3d at 1323. As TWW correctly notes, “[a]dding such a limitation would unduly narrow the scope of the claims and would do just what Phillips warns against – import a limitation from certain embodiments into the claims.” TWW Opp. 32.

Because nothing in the claims or the specification mentions a pump housing, it would be improper for the Court to read a limitation into the claims simply because the disclosed embodiments all share that common feature. Nor does the Court find that anything in the prosecution history clearly indicates that the electric pump necessarily must contain a housing.

The Court therefore affirms Magistrate Judge Robinson’s construction that the “pump body” is “the main part of the pump.” Because it finds that the PTO’s construction is also correct, and provides greater specificity, it modifies the construction of “pump body” to be “the main part of the electric pump and to be a separate and distinct element from the air outlet.” Although the pump body will usually include a housing surrounding other pump components, the Court concludes that such housing is not a necessary element of the pump body.

For the foregoing reasons, it is hereby

ORDERED that the Court sets aside in part and adopts in part [145] Magistrate Judge Robinson’s decision; it is

FURTHER ORDERED that the term “socket” is construed as “a structure that fits and holds onto an inserted part so that the structure and the part are detachably connected to each other”; and it is

FURTHER ORDERED that the term “pump body” is construed as “the main part of the electric pump and to be a separate and distinct element from the air outlet.”

SO ORDERED.

DATE: September 24, 2013

/s/ _____
PAUL L. FRIEDMAN
United States District Judge

UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

_____)	
INTEX RECREATION CORPORATION,)	
)	
Plaintiff/Counterclaim-Defendant,)	
)	
v.)	Civil Action No. 04-1785 (PLF)
)	
TEAM WORLDWIDE CORPORATION,)	
)	
Defendant/Counterclaim-Plaintiff.)	
_____)	

OPINION

Ten years ago, defendant Team Worldwide Corporation (“TWW”) accused plaintiff Intex Recreation Corporation (“Intex”) of infringing the claims of TWW’s inflatable product patent. This lawsuit followed, and with it, the initiation of discovery, proceedings on a motion to dismiss, a reexamination by the U.S. Patent and Trademark Office (“PTO”), and claim construction proceedings.

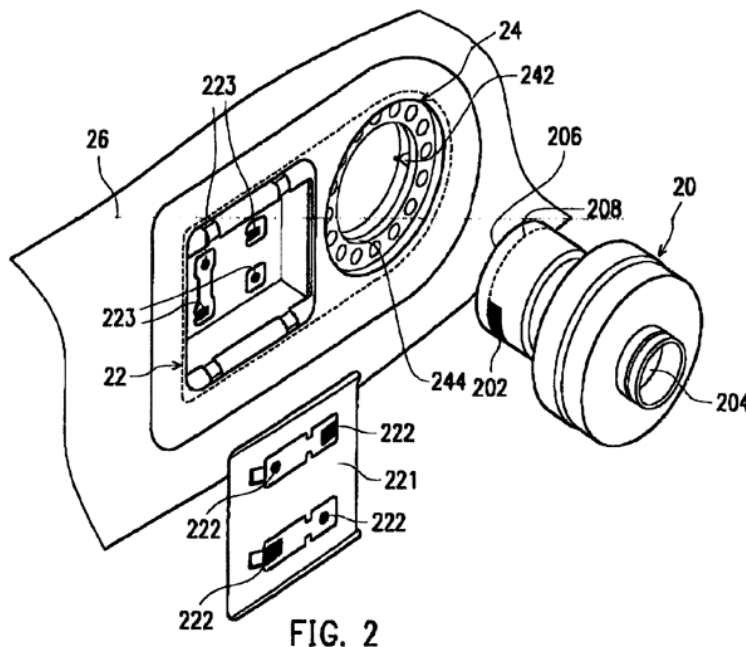
The issue that spurred this lawsuit – whether the air mattresses manufactured by Intex infringe any of the patent claims asserted by TWW – is now before the Court on the parties’ cross-motions for summary judgment. The question of infringement turns primarily on whether the air mattresses manufactured by Intex contain “sockets” as that term is used in TWW’s patent. After careful review of the patent documents, relevant legal authorities, and the arguments made by the parties in their papers and at oral argument on February 25, 2014, the Court concludes that Intex’s air mattresses do not contain “sockets” or their equivalents, and that Intex’s products therefore do not infringe TWW’s patent. The Court will grant Intex’s motion

for summary judgment, deny TWW's motion for summary judgment, and enter judgment for Intex on the issue of non-infringement.¹

¹ The papers reviewed in connection with the pending motions include the following: plaintiff's amended complaint ("Am. Compl.") [Dkt. No. 4]; defendant's answer to plaintiff's complaint and counterclaim ("TWW Answer and Counterclaim") [Dkt. No. 10]; United States Patent No. 6,793,469 B2 [Dkt. No. 10-1]; Opinion and Order granting in part and denying in part defendant's motion to dismiss, Intex Recreation Corp. v. Team Worldwide Corp., 390 F. Supp. 2d 21 (D.D.C. 2005); Magistrate Judge Robinson's claim construction decision, Intex Recreation Corp. v. Team Worldwide Corp., 541 F. Supp. 2d 113 (D.D.C. 2008); the undersigned's claim construction decision, Intex Recreation Corp. v. Team Worldwide Corp., --- F. Supp. 2d ---, 2013 WL 5328372 (D.D.C. 2013); the parties' briefs on claim construction, including plaintiff's motion for claim construction [Dkt. No. 141]; defendant's second motion for claim construction ("TWW Claim Constr. Mot.") [Dkt. No. 140-3], plaintiff's objections to Magistrate Judge Robinson's decision [Dkt. No. 147]; defendant's opposition to plaintiff's objections ("TWW Obj. Opp.") [Dkt. No. 156], and the transcript of the June 9, 2011 hearing on plaintiff's objections ("June 9, 2011 Tr.") [Dkt. No. 206]; declaration of Edward J. Naidich in support of plaintiff's previous motion for summary judgment ("Naidich Decl.") [Dkt. No. 155-5]; joint status report of November 12, 2010 ("Jt. Status Rpt.") [Dkt. No. 180]; defendant's motion for summary judgment ("TWW SJ Mot.") [Dkt. No. 211]; defendant's statement of material undisputed facts ("TWW SMF") [Dkt. No. 211-2]; declaration of Andrew R. Kopsidas in support of defendant's summary judgment motion ("Kopsidas Decl.") [Dkt. No. 211-3]; plaintiff's motion for summary judgment ("Intex SJ Mot.") [Dkt. No. 212]; plaintiff's statement of material undisputed facts ("Intex SMF") [Dkt. No. 212]; declaration of Andrew M. McCoy in support of plaintiff's summary judgment motion ("McCoy Decl.") [Dkt. No. 212-3]; plaintiff's opposition to defendant's summary judgment motion ("Intex SJ Opp.") [Dkt. No. 216]; plaintiff's statement of disputed material facts in support of its opposition to defendant's summary judgment motion ("Intex SMF Resp.") [Dkt. No. 216]; defendant's opposition to plaintiff's summary judgment motion ("TWW SJ Opp.") [Dkt. No. 217]; defendant's statement of disputed material facts in support of its opposition to plaintiff's summary judgment motion ("TWW SMF Resp.") [Dkt. No. 217-2]; defendant's reply in support of its summary judgment motion ("TWW SJ Reply") [Dkt. No. 219]; plaintiff's reply in support of its summary judgment motion ("Intex SJ Reply") [Dkt. No. 220]; parties' summary judgment hearing exhibit list ("Hr'g Ex. List") [Dkt. No. 221]; and the expert reports submitted by the parties, including the June 19, 2006 Expert Report of Dr. Steven Dubowsky ("Dubowsky Rpt.") [Dkt. No. 211-5], the August 28, 2008 Rebuttal Expert Report of Dr. Dubowsky ("1st Supp. Dubowsky Rpt.") [Dkt. No. 99-8], the November 1, 2013 Expert Report of Dr. Dubowsky ("2d Supp. Dubowsky Rpt.") [Dkt. No. 215-1], the January 25, 2011 Expert Report of John F. Berninger ("Berninger Rpt.") [Dkt. 216-2], and the December 12, 2013 Expert Report of Mr. Berninger ("Supp. Berninger Rpt.") [Dkt. No. 212-2].

I. BACKGROUND

The background of this case was summarized in the Court's September 24, 2013 Claim Construction Opinion and is reviewed only briefly here. Intex and TWW are manufacturers of air mattresses of the sort used in homes and on camping trips. They disagree as to the scope of United States Patent No. 6,793,469 B2 ("the '469 Patent"), currently owned by TWW. The invention claimed by the '469 Patent is an inflatable product comprised of an inflatable body, a socket, an electric pump that includes a pump body and an air outlet, and a battery case. See '469 Patent col.1 lines 30-35; id. at col.7 line 24–col.8 line 60. Two embodiments (examples) of the pump-socket connection in the claimed invention are shown below:



'469 Patent, fig. 2 (depicting first embodiment).

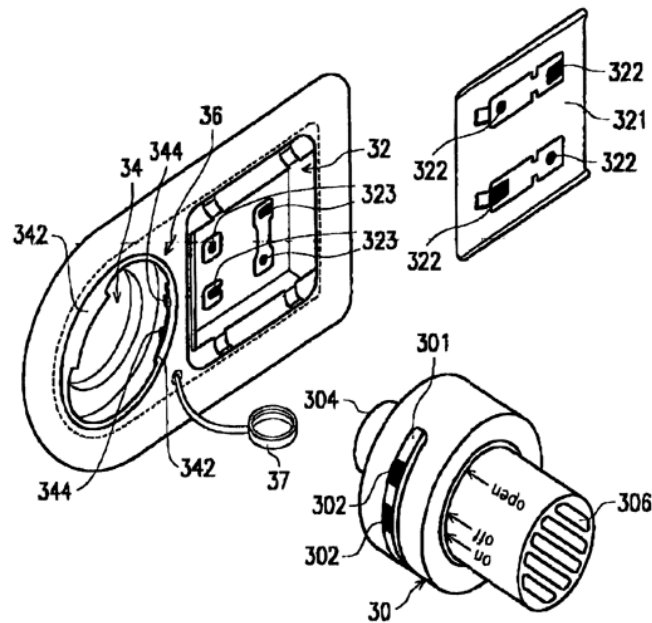


FIG. 4

'469 Patent, fig. 4 (depicting second embodiment).

On October 8, 2004, shortly after obtaining the '469 Patent, TWW sent a cease-and-desist letter to Intex in which TWW accused Intex of selling inflatable air mattresses that infringed the '469 Patent. TWW Answer and Counterclaim ¶ 7. In response, Intex filed this civil action against TWW, seeking a declaration of non-infringement as to the '469 Patent and a declaration of its invalidity.² TWW, in turn, filed a counterclaim asserting that Intex has infringed and continues to infringe the patent.

After discovery and resolution of a motion to dismiss, claim construction proceedings were held before Magistrate Judge Deborah A. Robinson, who issued her Markman decision on March 3, 2008. Intex Recreation Corp. v. Team Worldwide Corp., 541 F. Supp. 2d

² Intex's non-infringement claim is Count I of the Amended Complaint; in addition, Intex sought a declaration that the patent was invalid under 35 U.S.C. §§ 102 and 103 (Count II) and a declaration of invalidity as a result of inequitable conduct (Count III). See Am. Compl. The Court dismissed Count III on September 30, 2005. See Intex Recreation Corp. v. Team Worldwide Corp., 390 F. Supp. 2d 21 (D.D.C. 2005) ("Intex I").

113 (D.D.C. 2008) (“Intex II”).³ Intex timely objected to certain constructions in Magistrate Judge Robinson’s decision. Proceedings on these objections, however, were stayed pending the PTO’s reexamination of the ’469 Patent, which ultimately led to the PTO’s issuance of an *ex parte* reexamination certificate, in which the PTO confirmed that the ’469 Patent claims are patentable. See Jt. Status Rpt. 2. On September 24, 2013, the Court issued an opinion and order adopting in part and setting aside in part Magistrate Judge Robinson’s decision. Intex Recreation Corp. v. Team Worldwide Corp., --- F. Supp. 2d ----, 2013 WL 5328372 (D.D.C. 2013) (“Intex III”). The parties then filed cross-motions for summary judgment: TWW moved for a finding of literal infringement, and Intex moved for a finding of non-infringement, both literally and under the doctrine of equivalents.

II. LEGAL STANDARDS

Determining whether a patent has been infringed involves a two-step analysis: first, the Court must construe the relevant claim language to determine the meaning and scope of the patent claims; and second, the Court must compare the construed claims to the accused device to determine whether each claim element is present, either literally or equivalently. Markman v. Westview Instr., Inc., 52 F.3d 967, 976 (Fed. Cir. 1995), aff’d, 517 U.S. 370 (1996); see also Freedman Seating Co. v. American Seating Co., 420 F.3d 1350, 1356-57 (Fed. Cir. 2005); Zodiac Pool Care, Inc. v. Hoffinger Indus., Inc., 206 F.3d 1408, 1413 (Fed. Cir. 2000).

“[L]iteral infringement requires that each and every limitation set forth in a claim appear in an accused product.” Frank’s Casing Crew & Rental Tools, Inc. v. Weatherford Int’l, Inc., 389 F.3d 1370, 1378 (Fed. Cir. 2004)). A product that does not literally infringe a claim,

³ See Markman v. Westview Instr., Inc., 52 F.3d 967 (Fed. Cir. 1995), aff’d, 517 U.S. 370 (1996).

however, nevertheless may infringe under the doctrine of equivalents “if differences between the accused device and the claimed invention are ‘insubstantial.’” Desper Prods., Inc. v. QSound Labs, Inc., 157 F.3d 1325, 1338 (Fed. Cir. 1998). TWW, as the patentee, has the burden of establishing infringement at trial. See Medtronic, Inc. v. Mirowski Family Ventures, LLC, 134 S. Ct. 843, 846 (2014).

Whether an accused product infringes the properly construed claims of a patent is a question of fact. Desper Prods., Inc. v. QSound Labs, Inc., 157 F.3d at 1332. As with other types of civil litigation, however, summary judgment is available and appropriate in a patent infringement case when “there is no genuine issue as to any material fact and the movant is entitled to judgment as a matter of law.” FED. R. CIV. P. 56(a); see Taurus IP, LLC v. DaimlerChrysler Corp., 726 F.3d 1306, 1326 (Fed. Cir. 2013); Frank’s Casing Crew & Rental Tools, Inc. v. Weatherford Int’l, Inc., 389 F.3d at 1378; C.R. Bard, Inc. v. Advanced Cardiovascular Sys., Inc., 911 F.2d 670, 672 (Fed. Cir. 1990).

III. DISCUSSION

A. Claims 14-17 Of The ’469 Patent

The ’469 Patent sets forth 17 claims, but only Claims 14 through 17 are relevant to this patent infringement action. See TWW SJ Mot. 1. These claims are listed in the table below:

Claim	Claim Language
14	An inflatable product including: an inflatable body; a socket built in the inflatable body; an electric pump, including a pump body and an air outlet, connected to the socket to pump the inflatable body, wherein the pump body is wholly or partially located in the socket; a connector provided on the electric pump for connecting an external power to actuate the electric pump.
15	The inflatable product as claimed in claim 14 , wherein the pump body can be received partially or wholly in the socket in a first direction for inflating the inflatable body, and received in a second direction for deflating the inflatable body.
16	An inflatable product including: an inflatable body; a socket built in the inflatable body; an electric pump, including a pump body and an air outlet, connected to the socket to pump the inflatable body, wherein the pump body is wholly or partially located in tile (sic) socket, a portion of the electric pump is inserted into tile (sic) socket, and the portion of the electric pump and the socket are matched with each other to prevent an air leakage therebetween.
17	The inflatable product as claimed in claim 16 , wherein the pump body can be received partially or wholly in the socket in a first direction for inflating the inflatable body, and received in a second direction for deflating the inflatable body.

'469 Patent col.8 lines 29-60 (bold in original).

Of particular importance, the Court has construed the term “socket” as “a structure that fits and holds onto an inserted part so that the structure and the part are detachably connected to each other.” Intex III, 2013 WL 5328372, at *16. In so doing, the Court distinguished certain inflatable products in which the electric pump could be easily inserted into and removed from a socket in the inflatable body – which were claimed by the '469 Patent – from unclaimed inflatable products in which the pump was permanently housed inside the

mattress. See id. at *10-11 (noting that certain socket-less embodiments with permanent pumps were disclosed but not claimed in the patent specification).

Also relevant here, the term “electric pump” is construed as “an electronically powered machine or device for raising, compressing, or transferring fluids, including gases,” Intex II, 541 F. Supp. 2d at 118-19, and the term “pump body” is construed as “the main part of the electric pump and to be a separate and distinct element from the air outlet.” Intex III, 2013 WL 5328372, at *16.

B. The Accused Devices

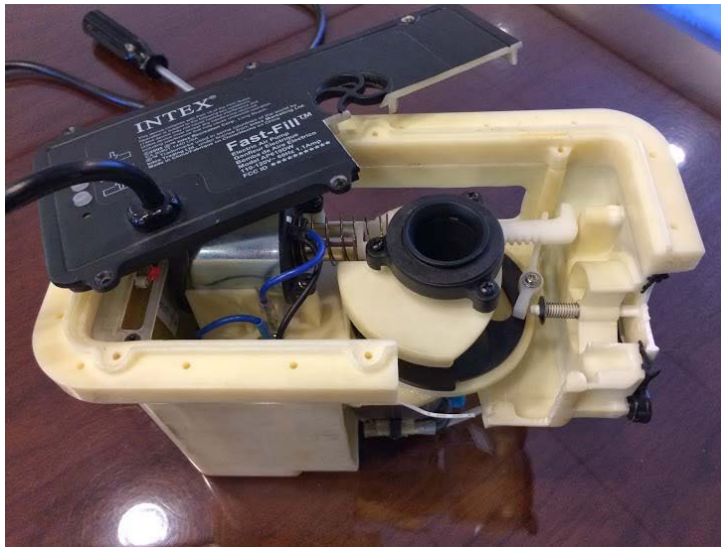
In manufacturing its air bed products, Intex employs two types of pumps accused of infringing the '469 Patent. See TWW SMF ¶ 1; Intex SMF Resp. ¶ 1. The first type, referred to as the “Pump A” models, includes model numbers 619RW and 619RL. TWW SMF ¶ 1; Intex SMF Resp. ¶ 1. The second type, the “Pump B” models, includes model numbers AP619, 639, and 626R. TWW SMF ¶ 1; Intex SMF Resp. ¶ 1. There is no dispute with respect to the structure of the accused pumps. Intex SMF ¶ 13; TWW SMF Resp. ¶ 13.

The Pump A model can inflate, but not deflate, an air mattress. TWW SMF ¶ 6; Intex SMF Resp. ¶ 6. The housing of the pump, which is built into an air mattress, serves as an opening into which various pump components – such as the motor, impeller unit, solenoid, and circuit board – are placed and fastened with screws. Intex SMF ¶¶ 14-15; TWW SMF Resp. ¶¶ 14-15. The faceplate of the pump also is connected to the housing with screws. Intex SMF ¶¶ 15-16; TWW SMF Resp. ¶¶ 15-16. The Pump A model requires between ten and eleven screws, and requires substantial disassembly to remove the pump components from the air mattress. Intex SMF ¶¶ 16-17; TWW SMF Resp. ¶¶ 16-17. The pump can be powered on by flipping a switch located on the faceplate, or by using a tethered remote. TWW SMF ¶ 6; Intex

SMF Resp. ¶ 6. Male bayonet-type connectors are provided to receive power from an AC power cord. TWW SMF ¶ 8; Intex SMF Resp. ¶ 8.

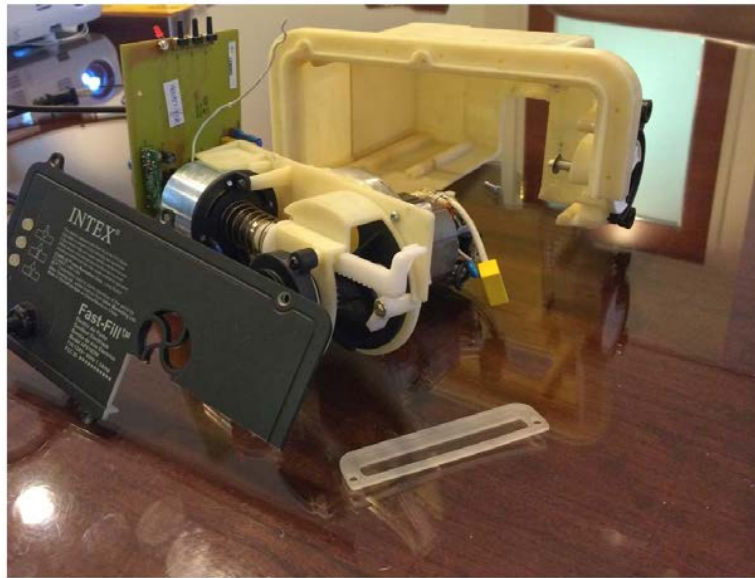
At oral argument, counsel for Intex introduced as physical exhibits for the Court's inspection examples of the Pump A model. See Hr'g Exs. 4, 4A, 7. The Pump A model is depicted below in photographs 1 through 3, supplied by Intex, and in a simplified illustration, Dr. Dubowsky's Figure 8, prepared by TWW's expert.

Photograph 1: Pump A



McCoy Decl. ¶ 8, Ex. 4 at 2 (corresponding to Hearing Exhibit 7); see Hr'g Ex. List at 2.

Photograph 2: Pump A

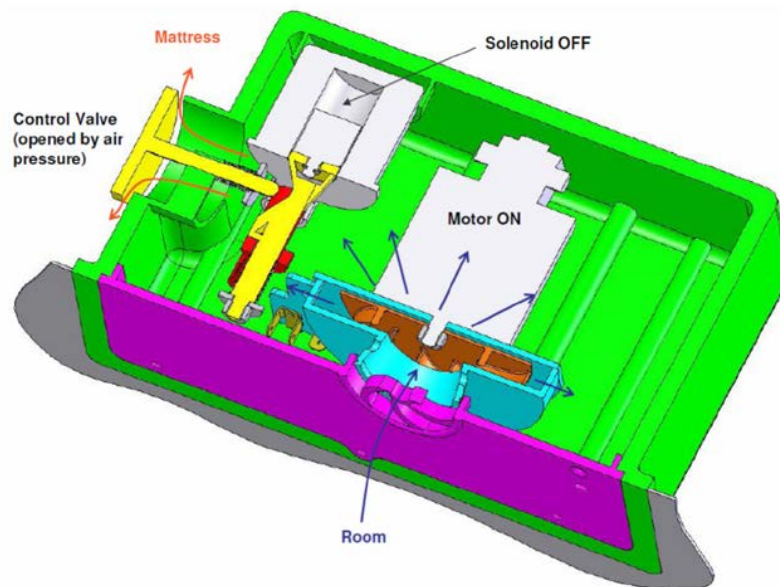


McCoy Decl. ¶ 8, Ex. 4 at 8 (corresponding to Hearing Exhibit 4); see Hr'g Ex. List at 2.

Photograph 3: Pump A



Naidich Decl. ¶ 4, Ex. 2 at 2.

Dr. Dubowsky's Figure 8: Pump A Configuration, Inflating

2d Supp. Dubowsky Rpt. 8.

In contrast to the Pump A model, the Pump B model can be used to both inflate and deflate the mattress. TWW SMF ¶ 9; Intex SMF Resp. ¶ 9. Similar to the Pump A model, however, the Pump B model contains a housing that is built into the interior of an air mattress. Intex SMF ¶ 19; TWW SMF ¶ 9. The housing in Pump B, like that in Pump A, serves as an opening into which components are placed and fastened with screws. Intex ¶¶ 16-20; TWW SMF ¶¶ 16-20. A faceplate is connected to the housing with screws. Intex SMF ¶ 21; TWW SMF Resp. ¶ 21. Between eight and ten screws are used in the assembly of the Pump B models, and substantial disassembly is required to remove the pump from an air mattress. Intex SMF ¶¶ 21-22; TWW SMF Resp. ¶¶ 21-22. Unlike Pump A, Pump B models include a valving mechanism. Intex SMF ¶ 20; TWW SMF Resp. ¶ 20. Pump B products are compatible with both AC and DC power packs, and contain male bayonet-type connectors provided on the

electric pump to receive the AC or DC electrical power. TWW SMF ¶ 15; Intex SMF Resp.

¶ 15.

During oral argument, counsel for Intex introduced several Pump B devices as physical exhibits for the Court's inspection. See Hr'g Exs. 1-3, 3A, 5, and 6. Examples of the Pump B model are depicted below in photographs 4 through 6, supplied by Intex, and in the illustration, Dr. Dubowsky's Figure 3, prepared by TWW's expert.

Photograph 4: Pump B



McCoy Decl. ¶ 9, Ex. 5 at 2 (corresponding to Hearing Exhibit 5); see Hr'g Ex. List at 2.

Photograph 5: Pump B

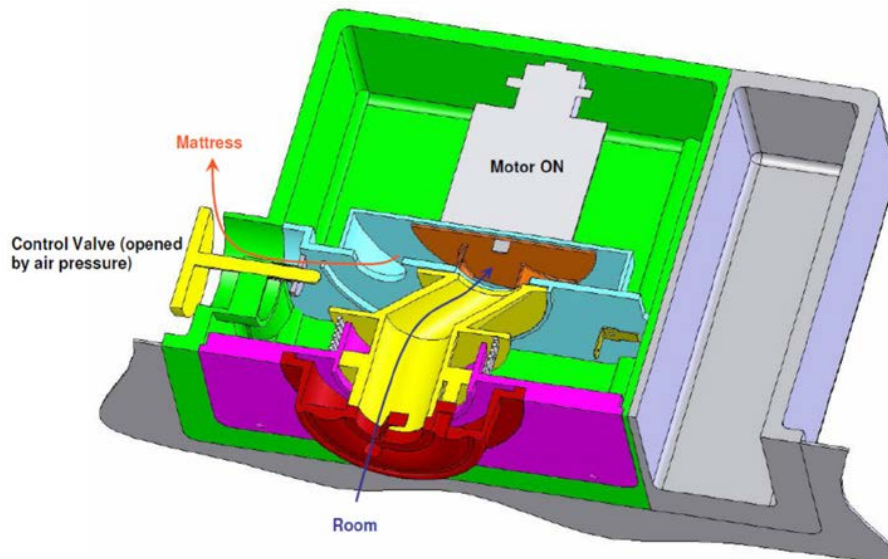


McCoy Decl. ¶ 9, Ex. 5 at 6 (corresponding to Hearing Exhibit 3); see Hr'g Ex. List at 1.

Photograph 6: Pump B



Naidich Decl. ¶ 7, Ex. 5 at 3.

Dr. Dubowsky's Figure 3: Pump B Configuration, Inflating

2d Supp. Dubowsky Rpt. 7.

C. The Accused Devices Do Not Literally Infringe The '469 Patent

As noted, “literal infringement requires that each and every limitation set forth in a claim appear in an accused product.” Frank’s Casing Crew & Rental Tools, Inc. v. Weatherford Int’l, Inc., 389 F.3d at 1378. “Any deviation from the claim precludes . . . a finding [of literal infringement].” Telemac Cellular Corp. v. Topp Telecom, Inc., 247 F.3d 1316, 1330 (Fed. Cir. 2001).⁴ “There can be no literal infringement where a claim requires two separate structures and one such structure is missing from an accused device.” Becton, Dickinson & Co. v. Tyco Healthcare Grp., LP, 616 F.3d 1249, 1255 (Fed. Cir. 2010) (citing Gaus v. Conair Corp., 363 F.3d 1284, 1288-90 (Fed. Cir. 2004))

⁴ An element or limitation is a “discretely claimed component of a patent claim.” Black’s Law Dictionary 597 (9th ed. 2009). Each element or limitation in a patent claim “is deemed material to defining the scope of the patented invention.” Warner-Jenkinson Co., Inc. v. Hilton Davis Chemical Co., 520 U.S. 17, 29 (1997).

When the parties agree on the features of the accused device, the question of literal infringement “collapses into claim construction” and can be decided as a matter of law. Desper Prods., Inc. v. QSound Labs, Inc., 157 F.3d at 1332-33. When construing claims, “a court generally must give claim terms ‘their ordinary and customary meaning’ as those terms would have been understood by ‘a person of ordinary skill in the art in question,’” – here, the field of pneumatics. Intex III, 2013 WL 5328372, at *4 (quoting Phillips v. AWH Corp., 415 F.3d 1303, 1312-13 (Fed. Cir. 2005 (en banc))). Because each claim of the ’469 Patent includes the limitation of a socket, and because a person of ordinary skill in the art of pneumatics would find that no socket is present in the accused devices, there can be no literal infringement.

Intex maintains that each device introduced at oral argument and represented in the photographs and figures above is a self-contained electric pump, and that this pump is directly welded to the inflatable mattress. Intex SJ Opp. 21-26. According to Intex, no separate socket is necessary or present. Id. By contrast, TWW contends that the electric pump in the accused products is comprised solely of the inner pump components – including the motor, impeller unit, solenoid and circuit board – and the pump’s faceplate. TWW SJ Mot. 14-18. The housing surrounding these components is not part of the pump, TWW asserts; rather, according to TWW, the housing itself is a separate socket. Id. Under TWW’s interpretation of the accused products, Pump A contains all of the elements recited in Claims 14 and 16, and Pump B contains all of the elements in Claims 14 through 17. See TWW SJ Mot. 1, 23. There are two fatal problems with TWW’s theory.

1. The Pump Housing In The Accused Devices Is Part Of The Electric Pump

If the housing surrounding the inner pump components is part of the electric pump, then it cannot satisfy the separate claim element of a socket. This conclusion flows from

the general rule that when a patent claim lists elements separately, as the '469 Patent does with the pump and the socket, those elements are considered to be “distinct component[s]” of the patented invention. Becton, Dickinson & Co. v. Tyco Healthcare Grp., LP, 616 F.3d at 1254 (internal quotation omitted). For example, in Becton, the Federal Circuit found that a claim listing a “hinged arm” and a “spring means connected to said hinged arm” called for two *separate* structural elements: the hinged arm and the spring means. Id. at 1253-55. These two elements could not be present in the same structure. Id. Likewise, if the housing in Intex’s devices is part of the electric pump, the housing cannot also satisfy the separate claim limitation of a socket. For the reasons below, the Court finds no genuine dispute of fact as to this issue; it is clear that a person of ordinary skill in the field of pneumatics would view the housing in the accused devices to be part of the electric pump, not a distinct structural element. The Court therefore must conclude that the housing does not satisfy the socket limitation.

As the Court observed in its Markman Opinion, an electric pump typically will include a pump housing. Intex III, 2013 WL 5328372, at *15 (“[B]ecause the Court finds that the claims require a pump that is detachably connected to a socket . . . the Court would expect that the typical electric pump designed in accordance with the '469 Patent would contain a housing to cover the fan and motor.”). Indeed, TWW conceded that “in certain embodiments, there may be a pump housing and, in certain embodiments, the housing may be a part of the main part of the pump.” TWW’s Obj. Opp. 32.

Intex has submitted evidence that the pump housing in the accused devices would be considered by a person of ordinary skill in the art to be part of the pump itself. The housing naturally is considered as part of the pump, according to Intex’s expert, “because without [the housing], the pumps would not work.” Supp. Berninger Rpt. ¶ 15. The pumps in the accused

devices only function within pressurized chambers; without a housing to maintain the necessary pressure, the pump is useless. Id. Intex also points to evidence that a pump housing has been considered to be part of a pump in related proceedings before the PTO. Berninger Rpt. ¶¶ 14-16. Intex's arguments are consistent with the Court's observation that the electric pump usually will include a housing. Intex III, 2013 WL 5328372, at *15.⁵

By contrast, TWW points to no expert testimony or other evidence suggesting that a person of ordinary skill in the art would view the pump housing as something separate from the pump itself, and responds to Intex's evidence only with attorney argument. TWW Reply 6-8. TWW observes that the housing can be disconnected from other pump components during disassembly, and then argues that this fact proves that the housing cannot be considered part of the pump. Id. As noted, TWW does not provide any expert evidence to support this proposition. Moreover, its argument makes no sense. Various other pump components – such as the faceplate and the impeller unit – can be disconnected from each other during disassembly; this does not mean that each component corresponds to a discrete limitation of the patent claim. The inquiry is whether a person of ordinary skill in the art would view the components as together comprising a pump – not whether the individual components can be physically taken apart.

Because there is no genuine question that the pump housing in the accused devices would be viewed as part of the pump itself, the housing cannot satisfy the separate claim

⁵ Intex also draws the Court's attention to the testimony of TWW's expert, who states that "[i]f an engineer or consumer were to purchase something described as an 'electric pump' that only had an air compressor and attached electric motor (*lacking a housing*, air inlets and outlets, appropriate power connections, etc.), it would not meet their expectations of a useful device." See 1st Supp. Dubowsky Rpt. ¶ V.e.iii (emphasis added). The Court draws no inferences from this testimony, however, as it is not clear whether the housing referenced by Dr. Dubowsky is the impeller housing within the pump or the housing surrounding the other pump components.

limitation of a socket. Neither party has suggested that any other element in the accused devices is a socket. The Court therefore concludes that the claim limitation of a socket is not present in the accused devices.

2. Even If The Housing Is Not Part Of The Pump, It Does Not Meet The Definition Of A Socket, As Construed By This Court

Even if the pump could logically refer only to the various inner pump components and faceplate – such that the housing constitutes some other, non-pump element – the housing does not meet the definition of a “socket.” As construed in the Court’s Markman opinion, the term “socket” is “a structure that fits and holds onto an inserted part so that the structure and the part are detachably connected to each other.” Intex III, 2013 WL 5328372, at *16. In the claim construction proceedings, the parties and the Court used the phrase “to fit and hold onto” as meaning “to grip,” akin to a light bulb socket that fits and holds onto a light bulb, or electric socket that fits and holds a plug, or, as discussed at oral argument, a lid that fit and holds onto a mason jar. See, e.g., id. at *7; TWW’s Obj. Opp. 16, 17, 43 (objecting to “fit and hold onto/grip” construction).

Unlike a light bulb socket, electric socket or mason jar lid, the housing in the accused devices does not fit and hold onto the pump components. As demonstrated at oral argument, if the pump components are placed inside the housing, and the housing is turned upside down, the pump components fall out of the housing. See Supp. Berninger Rpt. ¶¶ 21-22. The eight to eleven screws, which attach the inner pump components to the housing, are necessary to create a tight fit. Id.; see also Dubowsky Rpt. ¶ VI(a)(iii), (b)(iii); 2d Supp. Dubowsky Rpt. ¶ IV(d).

Nor are the pump components “detachably connected” to the housing. For example, to detach the impeller unit from the housing in a Pump A product, a user must first remove the faceplate by unscrewing the six screws that attach the faceplate to the housing. *Intex SMF* ¶ 17; *TWW SMF Resp.* ¶ 17. The user must then remove four screws attaching the impeller unit to the housing. *Id.* The user cannot remove the pump components from the inflatable body without effectively disassembling the pump. And while counsel for TWW insists that being “detachably connected” is no different from the ability to be “disassembled” – a “semantic” difference rather than one of substance, see *TWW SJ Opp.* 10 – the Court cannot agree. Removing eight to eleven screws with a screwdriver is quite different in form from turning the lid of a mason jar or unscrewing a light bulb; the one constitutes a time-consuming disassembly while the other is a seconds-long turning of a lid or bulb.

TWW also contends that the distinction between a socket and a housing is purely semantic and not substantive. *TWW Opp.* at 2. But the Court rejected TWW’s virtually identical argument that a socket was equivalent to a chamber in its Markman Opinion. *Intex III*, 2013 WL 5328372, at *9-12. For the same reasons, it rejects TWW’s argument here. Equating a socket and a housing would require the Court to ignore entirely the “fit and hold” and “detachably connected” aspects of a socket as already construed.

In sum, the Court finds that the accused products do not contain a “socket,” as construed by the Court, and therefore do not literally infringe Claims 14 through 17 of the ’469 Patent.

D. The Accused Devices Do Not Infringe Under The Doctrine Of Equivalents

TWW next argues that even if the housing is not literally a socket, it is equivalent to a socket, and thus falls within the patent’s scope under the doctrine of equivalents. The

doctrine of equivalents holds that a patent's scope "is not limited to its literal terms but instead embraces all equivalents to the claims described." Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd., 535 U.S. 722, 732 (2002) (citing Winans v. Denmead, 56 U.S. 330, 347 (1854)).

The purpose of the doctrine of equivalents is to "prevent[] an accused infringer from avoiding infringement by changing only minor or insubstantial details of a claimed invention while retaining their essential functionality." Sage Prods., Inc. v. Devon Indus., Inc., 126 F.3d 1420, 1424 (Fed. Cir. 1997) (citation omitted). It should be noted, however, that a finding of infringement under the doctrine of equivalents is "the exception and not the rule." EPOS Techs. Ltd. v. Pegasus Techs. Ltd., 916 F. Supp. 2d 88, 92 (D.D.C. 2013) (citing London v. Carson Pirie Scott & Co., 946 F.2d 1534, 1538 (Fed. Cir. 1991)). The doctrine's reach is limited by the recognition that it "necessarily adds uncertainty to the scope of patent claims, and thereby detracts from the public-notice function of patent claims and risks deterring non-infringing and potentially innovative endeavors." Freedman Seating Co. v. American Seating Co., 420 F.3d at 1358.

1. Claim Vitiating

Equivalence is an issue of fact ordinarily preserved for a jury. Charles Machine Works, Inc. v. Vermeer Mfg. Co., 723 F.3d 1376, 1380-81 (Fed. Cir. 2013). But summary judgment may be awarded to an alleged infringer if the patentee fails to point to "particularized testimony and linking argument" of equivalence. American Calcar, Inc. v. American Honda Motor Co., Inc., 651 F.3d 1318, 1338-39 (Fed. Cir. 2011) (internal quotation omitted). Where the record evidence "is such that no reasonable jury could determine two elements to be equivalent," a finding that an accused product infringes a claim under the doctrine of equivalents

would vitiate that claim element and is erroneous as a matter of law. Charles Machine Works, Inc. v. Vermeer Mfg. Co., 723 F.3d at 1380 (internal quotation omitted); accord Taurus IP, LLC v. DaimlerChrysler Corp., 726 F.3d at 1326; Freedman Seating Co. v. American Seating Co., 420 F.3d at 1358.

The Federal Circuit has articulated two tests for determining equivalence. One is to inquire whether the differences between an element in an accused device and an element in the patent claim are “insubstantial.” Mirror Worlds, LLC v. Apple Inc., 692 F.3d 1351, 1357 (Fed. Cir. 2012) (quoting Voda v. Cordis Corp., 536 F.3d 1311, 1326 (Fed. Cir. 2008)). Another is to examine whether the disputed feature “performs substantially the same function in substantially the same way to obtain substantially the same result” as the feature in the claimed invention. Id. (internal quotation omitted); see also Warner-Jenkinson Co., Inc. v. Hilton Davis Chem. Co., 520 U.S. 17, 39 (1997). Thus, “saying that a claim element would be vitiated is akin to saying that there is no equivalent to the claim element in the accused device based on the well-established ‘function-way-result’ or ‘insubstantial differences’ tests.” Brilliant Instruments, Inc. v. GuideTech, LLC, 707 F.3d 1342, 1347 (Fed. Cir. 2013) (internal quotation omitted). The inquiry into equivalence must be performed “on an element-by-element basis.” Warner-Jenkinson Co., Inc. v. Hilton Davis Chem. Co., 520 U.S. at 40; see also Freedman Seating Co. v. American Seating Co., 420 F.3d at 1358.

Although TWW asserts that there are genuine questions of material fact as to the issue of equivalence, the Court disagrees and finds that summary judgment of non-infringement under the doctrine of equivalents is appropriate here. The two-part analysis tracks the Court’s earlier discussion of literal infringement. First, for the reasons discussed *supra* at 15-17, the housing surrounding the pump components in Intex’s products is part of the electric pump itself,

and there simply is no element that corresponds to the socket element in the patent claims. The accused devices therefore cannot be held to infringe as equivalent, as “an accused product or process is not infringing unless it contains *each* limitation of the claim, either literally or by an equivalent.” Freedman Seating Co. v. American Seating Co., 420 F.3d at 1358 (emphasis added).

Second, even if permitted to view the housing as distinct from the pump, a jury could not reasonably conclude on the record evidence that the housing performs “substantially the same function in substantially the same way to obtain substantially the same result” as the socket in the ’469 Patent. See Mirror Worlds, LLC v. Apple Inc., 692 F.3d at 1357. The function-way-result analysis of TWW’s expert, Dr. Dubowsky, consists of a single, albeit lengthy sentence:

[T]he [housing] in the accused products performs *substantially the same function* as the socket recited in the claims and as construed by the Court (i.e., allowing the pump to be disposed wholly or partially inside the inflatable body, and yet be detachable if necessary, such as for servicing, cleaning, inspection or otherwise); in *substantially the same way* (i.e., by providing a compartment inside the flexible inflatable element that fits and holds the pump, so that the two are detachably connected to each other); to achieve *substantially the same result* (i.e., allowing the electric pump to stably pump the inflatable body without being held manually, providing a configuration that is compatible with conventional bedding and bed frames, and allowing for a more compact configuration that is functionally and aesthetically appealing, and yet be detachable if desired or necessary.)

2d Supp. Dubowsky Rpt. ¶ IV(g) (emphasis added).

Dr. Dubowsky gives no explanation of how he arrived at his conclusions about the “function,” “way,” or “result” of the socket. The function-way-result analysis requires “an examination of the claim and the explanation of it found in the written description of the patent.”

Aquatex Indus., Inc. v. Techniche Solutions, 479 F.3d 1320, 1326 (Fed. Cir. 2007) (internal

quotation marks omitted). But Dr. Dubowsky does not link his analysis to the patent claims or specification. He does not explain his conclusion that the socket's *function* is "allowing the pump to be disposed wholly or partially inside the inflatable body, and yet be detachable if necessary, such as for servicing, cleaning, inspection or otherwise," and he certainly does not connect this purported function to anything in the specification. Dr. Dubowsky makes no attempt, for example, to reconcile his theory of the socket's function with the requirement in Claims 15 and 17 that the socket permit detachment for purposes of deflating the mattress. See '469 Patent col.8 lines 29-60 (emphasis added).

Dr. Dubowsky also asserts that the housing operates in the same *way* as the socket, "by providing a compartment inside the flexible inflatable element that fits and holds the pump, so that the two are detachably connected to each other." 2d Supp. Dubowsky Rpt. ¶ IV(g) (emphasis added). This statement does not suffice to raise an inference that the housing in the accused products operates in the same way as a socket in the claimed invention. Not only does Dr. Dubowsky merely paraphrase the Court's construction of the term "socket," but he misinterprets the phrases "fit and hold" and "detachably connected" as used by the Court. Dr. Dubowsky concedes that the housing remains attached to the pump components only through the use of screws. Id. ¶ IV(d). This is not a "fit and hold" connection. Dr. Dubowsky also notes that in order to remove the pump, a user cannot do so manually, but must take the pump apart with a screw driver. Id. This is not "detachably connected." Where an expert's statements "rest on an incorrect claim interpretation . . . they do not create a factual dispute." Wiener v. NEC

Electronics, Inc., 102 F.3d 534, 542 (Fed. Cir. 1996), abrogated on other grounds, Cybor Corp. v. FAS Technologies, Inc., 138 F.3d 1448 (Fed. Cir. 1998).⁶

Construing the housing as equivalent to the socket would render meaningless the “fit and hold” and “detachably connected” aspects of this element – which the Court found critical in its Markman Opinion. This is untenable. “It is important to ensure that the application of the doctrine [of equivalents] . . . is not allowed such broad play as to effectively eliminate that element in its entirety.” Warner-Jenkinson Co., Inc. v. Hilton Davis Chem. Co., 520 U.S. at 29.

2. Additional Defenses To Infringement Under The Doctrine Of Equivalents

Intex also argued in its papers that its devices do not infringe under the doctrine of equivalents because the structures contained in the accused devices were foreseeable at the time of the invention. See Intex SJ Mot. 31-34; see also Johnson & Johnston Assocs., Inc. v. R.E. Serv. Co., Inc., 285 F.3d 1046, 1056-59 (Fed. Cir. 2002) (en banc) (Rader, J., concurring) (proposing foreseeability limitation to doctrine of equivalents). As Intex conceded at oral argument, however, this defense is foreclosed by the Federal Circuit’s recent decision in Ring & Pinion Serv. Inc. v. ARB Corp. Ltd., --- F.3d ----, 2014 WL 627623 (Fed Cir. 2014), where a unanimous panel held that “[t]here is not, nor has there ever been, a foreseeability limitation on the application of the doctrine of equivalents.” Id. at *2.

Intex instead presented an alternative argument that the principle of disclosure-dedication bars TWW from alleging infringement. The disclosure-dedication principle holds that “when a patent drafter discloses but declines to claim subject matter . . . this action dedicates that unclaimed subject matter to the public.” Johnson & Johnston Assocs., Inc. v. R.E. Serv. Co., Inc., 285 F.3d at 1054. Intex contends that the accused devices are analogous to the so-called

⁶ As discussed at oral argument, Intex does not challenge Dr. Dubowsky’s “result” analysis. See also Intex SJ Opp. 24-25.

“chamber” embodiments disclosed but not claimed in the ’469 Patent specification. Because this argument has not been fully briefed, and because the Court finds non-infringement under the doctrine of equivalents on the ground of claim vitiation, the Court does not reach the question of whether disclosure-dedication provides an alternative basis for a finding of non-infringement.

E. The Court Finds No Reason To Revisit Its Construction of Socket

As discussed above, the Court has construed the term socket to require a “fit and hold” connection with the pump – i.e., the socket must grip the pump like a light bulb socket, electric socket or top of a mason jar. TWW asks this Court to interpret the “fit and hold” requirement more broadly. In support of its argument, TWW asserts that certain embodiments disclosed in the patent specification have sockets that do not firmly grip or immobilize a pump and invokes the principle that “an interpretation which ‘excludes a [disclosed] embodiment from the scope of the claim is rarely, if ever, correct.’” SJ Reply 9 (quoting Accent Packaging, Inc. v. Leggett & Platt, Inc., 707 F.3d 1318, 1326 (Fed. Cir. 2013)). TWW’s argument is meritless.

TWW points to the third disclosed embodiment, in which a pump is inserted into a socket, and a cover may be placed on top of the pump. TWW SJ Reply 9; see ’469 Patent col. 4 lines 3-65. TWW argues that this cover can serve a holding function similar to the function performed by the screws in the accused devices. TWW SJ Reply 9; see also 2d Supp. Dubowsky Rpt. ¶ IV(f). But this argument is directly contradicted by the patent specification, which states that the cover is used to protect the pump from water – not to hold the pump in place. ’469 Patent col. 4 lines 55-60; see also June 9, 2011 Tr. 47:8-16 (argument of TWW counsel) (explaining that cover is used to protect socket from wet environment). In the third embodiment, the socket clearly fits and holds onto (attaches to or grips) the pump. See ’469 Patent col. 4 lines 27-54

(describing flanges on pump and corresponding grooves on the socket that permit the pump and socket to be “firmly connected together”).

At oral argument, TWW asserted for the first time that the first embodiment disclosed in the specification lacks an immobilizing or gripping socket-pump connection. Counsel for TWW posited that the first embodiment requires the user to hold the pump in place while inflating the mattress. This interpretation of the first embodiment is plainly incorrect. TWW has previously asserted that the claimed invention allows the user to inflate or deflate the mattress *without* having to manually hold the electric pump in place, see TWW Claim Constr. Mot. 3, and its new reading of the first embodiment conflicts with these earlier assertions. Moreover, the Court reads the description of the first embodiment as requiring that the pump and socket be attachable, since the specification notes that the user must “*detach[]* the electric pump from the socket” in order to deflate the airbed. See ’469 Patent col. 3 lines 4-6 (emphasis added; citations to drawings omitted).

In its Markman opinion, the Court rejected TWW’s assertion that a socket should be broadly construed as an “opening or holder for something.” Intex III, 2013 WL 5328372, at *12-13, 16. TWW renews this argument in disguised form by arguing for a broad reading of the phrases “fit and hold” and “detachably connected” as used in the Court’s Opinion. TWW has failed to persuade the Court that there is any reason to reconsider its construction.

IV. CONCLUSION

For the foregoing reasons, the Court will grant plaintiff Intex's motion for summary judgment of non-infringement and will deny defendant TWW's motion for summary judgment.

An Order consistent with this Opinion will issue this same day.

DATE: March 10, 2014

/s/_____
PAUL L. FRIEDMAN
United States District Judge

UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

INTEX RECREATION CORPORATION,

Plaintiff/Counterclaim-Defendant,

v.

TEAM WORLDWIDE CORPORATION,

Defendant/Counterclaim-Plaintiff.

Civil Action No. 04-1785
PLF/DAR

MEMORANDUM OPINION AND ORDER

Defendant Team Worldwide (“TWW”) Corporation’s Motion for Claim Construction (Document No. 140) is pending for determination by the undersigned. Upon consideration of the motion; the memoranda in support thereof and in opposition thereto;¹ the proffers and arguments of counsel at the hearing on the motion; the parties’ Joint Statement of Undisputed Claim Construction Evidence (Document No. 142) (“Joint Statement”), and the entire record herein, Defendant’s motion will be **GRANTED IN PART**.

I. BACKGROUND OF THE INSTANT ACTION

Intex Recreation Corporation (“Intex”) is a California corporation engaged in the business of the distribution and sale of a variety of inflatable products, including air mattresses. *See*

¹ Defendant Team Worldwide Corporation’s Memorandum in Support of its Motion for Claim Construction (Document No. 140, Part 4) (“TWW’s Mem.”); Plaintiff Intex Recreation Corp.’s Claim Construction Brief (Document No. 141) (“Intex’s Brief”). *See also* Joint Statement of Disputed Claim Terms and Phrases (Document No. 138).

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Motion of Intex Recreation Corp[.] for Order Under Rule 56, Federal Rules of Civil Procedure that the Accused Products Do Not Infringe Claims 14-17 of the Patent-in-Suit (Document No. 101) at 2, n.2.

On September 21, 2004, the United States Patent and Trademark Office (“USPTO”) issued U.S. Patent No. 6,793,469 (“the ‘469 patent”), of which TWW is the owner by assignment. First Amended Complaint (Document No. 4) at 1; Intex’s Brief at 1. On about October 8, 2004, Intex received a letter from TWW in which TWW alleged that Intex had infringed the ‘469 patent by selling an inflatable air mattress with a built-in pump. First Amended Complaint, ¶7. Intex denies that its products infringe the ‘469 patent, and seeks a declaratory judgment that the ‘469 patent has not been infringed and that said patent is invalid pursuant to 35 U.S.C. §§ 102, 103. First Amended Complaint, ¶¶ 7-11, 12-15.²

_____TWW, in its answer, denies that Intex is entitled to any relief. In its counterclaim, TWW alleges that Intex has infringed, and continues to infringe, one or more claims of the ‘469 patent by unlawfully making, using, importing, selling, and/or offering for sale, inflatable mattress covered by one or more claims of the ‘469 patent. Answer (Document No. 10), ¶¶ 10-11, 14-15, 19-20; Counterclaim (Document No. 10), ¶¶ 8-10.

In its answer to the counterclaim, Intex denies TWW’s allegations, and alleges as affirmative defenses that TWW failed to state a claim upon which relief can be granted, and that the patent is invalid pursuant to 35 U.S.C. §§ 102, 103. Answer to Counterclaim (Document No.

² Intex’s claim that the patent is unenforceable as a result of the alleged inequitable conduct of TWW was dismissed by the court. *See* September 30, 2005 Memorandum Opinion (Document No. 20) at 1, 8.

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15), ¶¶ 12, 14.³

Following proceedings with respect to the conduct of discovery and other pretrial matters, TWW moved the court “to construe the claim terms of U. S. Patent No. [6],793,469 according to Exhibit A of this Motion.” Defendant Team Worldwide Corporation’s Motion for Claim Construction at 1; *see also* Joint Statement of Disputed Claim Terms and Phrases (Document No. 138) at 3.

II. STANDARDS GOVERNING CLAIM CONSTRUCTION

Claim construction is a question of law for the court. *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 384 (1996). “In construing patent claims, a court must start with the claim language and consider it in light of the specification and prosecution history, and if necessary use extrinsic evidence . . . to clarify any remaining ambiguity.” *Michilin Prosperity Co. v. Fellowes Mfg. Co.*, 450 F. Supp. 2d 35, 37 (D.D.C. 2006). In construing the claims, it is “the person of ordinary skill in the field of the invention through whose eye the claims are construed.” *Multiform Desiccants, Inc., v. Medzam, Ltd.*, 133 F.3d 1473, 1477 (Fed. Cir. 1998). In its interpretation of disputed claim terms, a court “should look first to the intrinsic evidence of record, *i.e.*, the patent itself, including the claims, the specification, and if in evidence, the prosecution history.” *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996). There is a “heavy presumption” that the terms used in the claims “mean what they say and have the ordinary meaning that would be attributed to those words by persons skilled in the relevant

³ The affirmative defense that the patent is unenforceable by reason of TWW’s alleged inequitable conduct was stricken by the court. *See* n.2, *supra*. Additional affirmative defenses were subsequently pled. *See* First Amended Answer of Counterclaim Defendant Intex Recreation Corp. to Counterclaim (Document No. 127).

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art.” *Texas Digital Sys., Inc. v. Telegenix, Inc.*, 308 F.3d 1193, 1202 (Fed. Cir. 2002); *see also CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002).

In its evaluation of the intrinsic evidence, a court may consult a dictionary and the inventor’s drawings. *Intex Recreation Corp. v. Metalast*, 245 F. Supp. 2d 65, 69 (D.D.C. 2003). “Dictionary definitions . . . are valuable resources to be used by a court at any time to assist in determining the ordinary meaning of claim language.” *Id.* (citations omitted). “Because words often have multiple dictionary definitions, some having no relation to the claimed invention, the intrinsic record must always be consulted to identify which of the different possible dictionary meanings of the claim terms in issue is most consistent with the use of the words by the inventor.” *Texas Digital Sys.*, 308 F.3d at 1203 (citations omitted). “[T]he presumption in favor of a dictionary definition will be overcome where the patentee, acting as his or her own lexicographer, has clearly set forth an explicit definition of the term different from its ordinary meaning.” *Id.* at 1204 (citations omitted). A court may consult the drawings “because drawings may graphically support the proper interpretation of the claim language.” *Intex*, 245 F. Supp. 2d at 69 (citing *Desper Products, Inc. v. Q Sound Labs, Inc.*, 157 F.3d 1325, 1333 (Fed. Cir. 1998)).⁴

This court has observed that “if the meaning [of a disputed claim term] is sufficiently clear from the intrinsic evidence, that meaning shall apply[,]” and that “extrinsic evidence may be considered only when the claim language remains genuinely ambiguous after consideration of the intrinsic evidence.” *Intex*, 245 F. Supp. 2d at 69 (citing *Frank’s Casing Crew Rental Tools*,

⁴ Upon consideration of this general standard, another judge of this court aptly observed that “[c]laim construction requires a degree of imagination from the Court.” *Thomson Consumer Electronics, Inc. v. Innovattron, S.A.*, 43 F. Supp. 2d 26, 29 (D.D.C. 1999).

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Inc. v. PMR Technologies, Ltd., 292 F.3d 1363, 1374 (Fed. Cir. 2002); *Bell & Howell Doc. Mgmt. Prods. Co. v. Altek Sys.*, 132 F.3d 701, 705-706 (Fed. Cir. 1997). However, extrinsic evidence “may not be used to vary or contradict the claim language.” *Vitronics*, 90 F.3d at 1584; *accord, Texas Digital Sys.*, 308 F.3d at 1212.

A technical term will generally be assigned the ordinary meaning that it would be given by one skilled in the art, unless ‘it is apparent from the patent and the prosecution history that the inventor used the term with a different meaning.’” *Intex*, 245 F. Supp. 2d at 68 (citing *Phillips Petroleum v. Huntsman Polymers*, 157 F. 3d 866, 871 (Fed. Cir. 1998)). “Deviation from the ordinary meaning of claim terms requires clear evidence” *Id.* Only when it appears that an inventor assigned a different meaning to the words in a claim than the ordinary meaning can the court adopt that other meaning. *Id.* (citation omitted).

III. DISCUSSION

The technology at issue in this action “is inflatable mattresses which are sold to consumers, to the consuming public, and that are inflated by the use of an electrical air pump.” Transcript of Markman Hearing, June 26, 2007 (Document No. 143) (“June 26, 2007 Tr.”) at 21. The disputed claim terms and phrases are (1) “socket”; (2) “electric pump”; (3) “connector”; (4) “inflatable body”; (5) “pump body”; (6) “air outlet”; (7) “connected to”; (8) “received” and (9) “matched[.]” Joint Statement of Disputed Claim Terms and Phrases at 3. Neither party called witnesses at the *Markman* hearing, and instead, each side relied upon the exhibits offered into evidence and counsel’s arguments with respect to the exhibits. *See* June 26, 2007 Tr. at 9. The proffers and arguments of counsel for the parties, and the undersigned’s findings with respect to

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each disputed term and phrase, are discussed in turn.

A. “socket”

The term “socket” is used in claims 14–17. Plaintiff contends that term means “a structure that fits and holds onto an inserted part . . . so that the structure and the part are detachably connected to each other.” Intex’s Brief at 26. Plaintiff contends that the embodiments of the pump and socket make it clear the pump is fitted in, put in or screwed together with the socket. *Id.* Plaintiff also cites the summary of the invention in the ‘469 patent’s specification in support of its proposed definition of socket, which provides that a pump is “detachably connected to the socket to pump the airbed.” *Id.* Plaintiff also argues that the court should reject the more expansive definition proposed by Defendant because in the ‘469 patent, Plaintiff contends that a “chambers” or “chamber device,” which Defendant includes in the definition of “socket,” is an opening or hollow for an inserted part that is not “detachably connected,” unlike parts placed in the “socket.” *Id.* at 28-32. Plaintiff contends that Defendant now seeks *post hoc* to expand the meaning of “socket” to encompass the meaning of “opening or hollow that forms a holder for something,” which it has already attributed to “chamber.” *Id.* at 29. Referring to Figs. 2 and 13A in the ‘469 patent, the Plaintiff contends that by using “socket” and “chamber” to refer to separate and distinct concepts, the court must construe them as having different meanings, as the court similarly did in *Bell Atlantic Network Services, Inc., v. Covad Commc’ns Group, Inc.*, 262 F.3d 1258 (Fed. Cir. 2001). *Id.* at 28. Plaintiff also contends that the prosecution history shows that the Defendant and the examiner repeatedly used the phrase “socket” to mean a structure that fits and holds onto a detachable pump. *Id.* 34-35. Plaintiff also

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relies on two dictionary definitions: “an opening or a cavity into which an inserted part is designed to fit: a light bulb socket”: and a “device designed to receive and grip the end of a tubular object, such as a tool or pipe.” *Id.* at 36 (citing American Heritage College Disctionary 1292 (3d ed. 1997); McGraw-Hill Dictionary of Scientific and Technical Terms 1853 (5th ed. 1994).

Defendant contends that its proposed construction uses the ordinary and customary meaning of “socket” and is supported by dictionary definitions, which the court can apply to determine the ordinary meaning of a term. TWW’s Mem. at 14. Defendant submits that its proposed construction is taken from Webster’s Ninth New Collegiate Dictionary (1991), where a “socket” is defined as “an opening or hollow that forms a holder for something.” *Id.* Defendant contends that “socket” does not have any technical meaning, and that the Dictionary of Mechanical Engineering defines it as “a hollow for something to fit into, or stand firm, or revolve in.” *Id.* Defendant contends that the claims only require that the pump be connected to the socket, and that the term should not be construed in a manner as limited as Plaintiff suggests. *Id.* at 15. Defendant acknowledges that Plaintiff contends that the embodiments show that the socket is for something that is detachably connected; however, Defendant contends that embodiments do not limit the claims to those embodiments, and that the patent specification it explicitly states that the invention was not limited to those embodiments. *Id.* Defendant submits that the Plaintiff’s proposed construction requiring that a part inserted must be “detachably connected” is not supported by intrinsic or extrinsic evidence. *Id.* at 18. The Defendant submits that the ‘469 patent is derived from U.S. Patent No. 6,332,760 (“760 patent”), the claim of which state that the electric pump is “detachably connected to the socket pump[,]” the court should

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interpret the claims consistently. *Id.* at 19 (citing *NTP, Inc. v. Research in Motion, Ltd.*, 418 F.3d 1282, 1293 (Fed. Cir. 2005)).

The undersigned has carefully considered the intrinsic evidence, including the dictionary definitions submitted by the parties. *See Intex Recreation Corp.*, 245 F. Supp. 2d at 68. The undersigned finds that the embodiments in the ‘469 patent do not limit the claims, as expressly stated in the patent. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1323 (Fed. Cir. 2005); U.S. Patent No. 6,793,469 at 7:14-23. In the ‘760 patent, the Defendant expressly used the term “detachably connected,” but in the ‘469 patent term is not used. The undersigned did not find anything in the intrinsic evidence that requires a part inserted into the socket to be “detachably connected” and therefore finds, as Defendant proposed, that the term socket, in its ordinary meaning, is an opening or hollow that forms a holder for something.

B. “pump body”

The Plaintiff contends that “pump body” refers to the covering of the parts of the pump in the ‘469 patent. Intex’s Brief at 18. Plaintiff relies on the claim language in support of its proposed construction: “an electric pump, including a pump body and an air outlet, connected to the socket to pump the inflatable body.” *Id.* Plaintiff contends that Defendant’s proposed construction is contrary to the ‘469 patent’s claim language and specification, more specifically, Plaintiff contends that claims 14 and 16 require the pump to be wholly or partially inserted, but in Fig. 3A, it appears that what would be considered the main part of the pump is located outside of the socket. *Id.* at 23-24. Plaintiff argues that Defendant fails to articulate how the main part of the pump, which it calls the “pump body,” differs from the pump itself, or any single part of

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the pump, or any combination less than all of the parts that make up the pump. *Id.* at 24.

Plaintiff also contends that Defendant has used the term “pump body” in the same matter that Plaintiff defines it in a related patent application. *Id.* at 21-23.

Defendant contends that “pump body” has no special technical meaning and that it is widely accepted that “body” means main or central part. TWW Mem. at 21 (citing The American Heritage Dictionary of the English Language (2000)). Defendant contends that the Plaintiff’s proposed construction ignores the intrinsic record, the relevant extrinsic record, and the law of claims construction *Id.* at 22. Defendant observes that the examiner originally rejected the claims, and that Defendant had to amend its claims to make it clear that the electric pump consisted of a pump body and an air outlet, and that the pump body is wholly or partially disposed in the socket. *Id.* at 24 (citing Forman Decl. Ex. 2, TWW 000358-60).

The undersigned finds that the construction proposed by the Plaintiff is unwarranted. In reviewing the patent and the prosecution history, the undersigned finds that the construction proposed by Defendant - - that a pump body is the main part of the pump -- is consistent with the law governing claims construction. The ‘469 patent includes the phrase “. . . an electric pump, *including* a pump body and an air outlet” (emphasis added). The court finds that the electric pump refers to everything including the housing, which also includes the pump body referring to the parts that actually make the pump. *See* ‘460 Patent, claim 14; Fig 2, 3A. Therefore the ordinary meaning to a person skilled in the art of pumps, would consider pump body to mean the main part of the pump.

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C. “electric pump”

Plaintiff contends that “electric pump” refers to an electrically powered device that is made up of components, which cooperate together to inflate or deflate the inflatable body. Intex’s Brief at 39. In proposing this construction, the Plaintiff refers to the claim language itself, “electric pump . . . to pump the inflatable body,” and suggests that in order for the electric pump to do so, it must include certain components to be able to “pump.”

Defendant contends that an electric pump is “ an electronically powered machine or device for raising, compressing, or transferring fluids, including gases[,]” referring to the definition found in The American Heritage Dictionary of the English Language (2000). TWW’s Mem. at 25.

The parties’ proposed constructions are very similar. Plaintiff’s proposed construction does not mention gases or fluids, yet Plaintiff does not dispute that a pump can act upon gases and fluids. *See* Intex’s Brief at 39. However, the undersigned does not see anything in the record which would warrant a finding that the ordinary meaning to those skilled in the art would be that an electric pump could only be used to inflate or deflate an inflatable body. Accordingly, the undersigned finds that the Defendant’s proposed construction is the proper one.

D. “air outlet”

Plaintiff’s proposed construction for air outlet is “a passage that permits air to travel out of the pump.” Intex’s Brief at 40. Plaintiff relies on the American Heritage College Dictionary definition of outlet: “passage for escape or exit; a vent.”

Defendant’s proposed construction for air outlet is “hole from which air emerges.”

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TWW's Mem. at 25. However, Defendant characterizes the differences between the parties' proposed constructions as "trivial[.]" and represents that it conditionally offered to accept Plaintiff's proposed construction. *Id.*

The undersigned, after reviewing the patent and the dictionary definition, finds that the proposed construction by Plaintiff is the correct one. Indeed, Defendant offers no evidence or authority in support of its proposed construction.

E. "connected to"

Plaintiff's proposed construction of "connected to" means that the electric pump must be "coupled" "or" "joined," not merely touching. Intex's Brief at 40. Plaintiff states that the claims, viewed with the specification and prosecution history, support its proposed construction. *Id.*

Defendant contends that it used connected in a "broad sense" in its patent to mean more than "just joined[.]" and in support of this construction, Defendant refers to the prior art figures specifications that states that "the electric pump 14 is connected to the valve 12 in direction B and then rotated in direction A to fasten the connection between the electric pump 14 and airbed 10." TWW's Brief at 26 (citing U.S. Patent No. 6,793,469 at 1:20-23). Defendant contends that this demonstrates that the term "connected to" is broader than "joined[.]" since the valve is joined after the two are connected. *Id.*

The undersigned finds that Plaintiff's proposed construction is the one which is consistent with the law governing claims construction. Merriam-Webster Dictionary defines connected as "joined or linked together." In reviewing the patent and the intrinsic evidence, the court finds

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that a person skilled in the art would consider connected to be more than mere touching.

F. “connector”

Plaintiff’s proposed claim construction for connector is “a structure that is arranged on the pump as to form a detachable circuit between and outside power source and the pump.” Intex’s Brief at 41. Claim 14 provides that “a connector provided on the electric pump for connecting an external power to actuate the electric pump.” Plaintiff argues this claim language supports its proposed construction, where “connector provided on the electric pump” refers to a “structure” that is on the pump. *Id.* Plaintiff contends that “for connecting an external power” requires that the structure be able to “form a detachable circuit” between the power source and pump. The phrase “to actuate the electric pump,” Plaintiff contends, requires that the structure has to be used to activate a motor in the pump. *Id.* In additional support of its contention, Plaintiff cites the American Heritage College Dictionary 295 (3d ed. 1997), which defines “connect” as “[t]o join to or by means of a communications circuit.” *Id.* at 42.

Defendant’s proposed construction for “connector” is something that permits passage of electrical current. TWW’s Mem. at 26. Defendant contends that there is no support in the intrinsic evidence to support Plaintiff’s requirement of “detachable” and “circuit.” *Id.*

The undersigned has reviewed the language of claim 14 and finds that the proposed construction by the Defendant is correct. The claim language which requires a “connector provided . . . for connecting an external power to actuate the electric pump” means that a “connector” permits passage of electrical current.

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G. “matched”

Plaintiff’s proposed construction of “matched” in claim 16 is that the term refers to an airtight seal formed between part of the pump and the socket when the pump is inserted into the socket. Intex’s Brief at 42. Plaintiff contends the claim language “a portion of the electric pump is inserted into tile [sic] socket” refers to a part of the pump that has been put inside the socket. *Id.* at 43. The phrase “to prevent an air leakage therebetween” refers to an airtight seal between part of the pump and the socket. *Id.*

Defendant’s proposed construction is that the term “matched” means geometrically matched. TWW’s Mem. at 28. In support of its proposed construction, the Defendant refers to the specification, particularly the first embodiment, which shows that part of the pump’s exterior is round to provide a “geometric match” to the round interior socket. *Id.* (citing U.S. Patent 4,793,469 at Fig. 2). The Defendant also refers to Fig. 4 and Fig. 8D. *Id.* at 29.

The claim 16 language at issue is “a portion of the electric pump is inserted into tile [sic] socket, and the portion of the electric pump and the socket are matched with each other to prevent an air leakage therebetween.” The undersigned has considered the arguments of both parties and the intrinsic evidence carefully and also reviewed a dictionary definition. Merriam-Webster (on-line) defines “match” as “to fit together or make suitable for fitting together.” The undersigned finds that for the patent to work, there must be a way to eliminate air leakage; after reviewing the intrinsic record, the court finds that the construction proposed by Defendant is consistent with law governing claims construction.

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H. “received”

Plaintiff contends that “received” refers to “a pump body that is inserted in the socket along first and second paths to inflate and deflate the inflatable body, respectively.” Intex’s Brief at 43-44. The claim language on which Plaintiff relies is the phrase “in a first direction for inflating[,]” which it interprets as meaning that the pump body must be inserted inside the socket by moving it along a first path. *Id.* at 43. The second phrase “received in a second direction for deflating” means to deflate the pump has to be inserted inside the socket along a second path. *Id.* at 44.

Defendant contends that “received” means “positioned or oriented.” TWW’s Mem. at 27. Defendant contends that the specification uses the term “received” multiple times to describe the position or orientation of the pump body in the socket for deflation or inflation, describing in particular in the eighth and ninth embodiment. *Id.*

The court has reviewed the ‘469 patent and has looked at the use of “received” in the patent and the specification. The court finds that the term “received” refers to “position or orientation.” *See* U.S. Patent No. 6,793,469 at 6:47-48. The claim language “pump body can be received . . . in the socket in a first direction for inflating the inflatable body, and received in a second direction for deflating . . .” supports the construction that the pump can be positioned one way to inflate and another to deflate. Accordingly, it is Defendant’s proposed construction of this term which is consistent with the law of claims construction.

I. “inflatable body”

Plaintiff contends that the term “inflatable body” refers to a structure that expands or

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contracts when either air or liquid is drawn into or out of it. Intex's Brief at 37. Plaintiff admits that '469 patent specification does not define "inflatable body," but that the ordinary and customary meaning is a structure that expands or contracts when air or liquid is drawn into or out. *Id.* at 37-38. Plaintiff contends that it is not required to be airtight, and that it normally is not considered airtight and that air mattresses are not airtight. *Id.* at 39.

Defendant contends that "inflatable body" is a substantially airtight structure that expands when filled with air or other gases. TWW's Mem. at 27. The Defendant cites Random House Webster's Unabridged Dictionary, 2d Ed. (1998) in defining inflatable as "capable of being inflated; designed or built to be inflated before use, to cause to expand or distend with air or gas." The Defendant contends that the specifications show that there is an air outlet and therefore no need to require liquid in the definition. *Id.*

The court finds that the Defendant's proposed construction for "inflatable body" is the correct construction. Plaintiff argues that air mattresses were not airtight; however, Defendant states that the inflatable body is *substantially* air tight, and does not claim that it is airtight. The Defendant's position is not only supported by the intrinsic record and is consistent with the dictionary definition. *See* The American Heritage Dictionary of the English Language (2000).

VI. CONCLUSION

For all of the foregoing reasons, it is **ORDERED** that Defendant Team Worldwide Corporation's Motion for Claim Construction (Document No. 140) is **GRANTED IN PART**, and that the following terms and phrases are hereby construed in the manner proposed by Defendant: "socket"; "pump body"; "electric pump"; "connector"; "matched"; "received"; and

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“inflatable body[.]”

It is **FURTHER ORDERED** that with respect to the phrases “connected to” and “air outlet[.]” Defendant’s motion is **DENIED**, and that those phrases are hereby construed in the manner proposed by Plaintiff.

March 28, 2008

/s/
DEBORAH A. ROBINSON
United States Magistrate Judge

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UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

_____)	
INTEX RECREATION CORPORATION,)	
)	
Plaintiff/Counterclaim-Defendant,)	
)	
v.)	Civil Action No. 04-1785 (PLF)
)	
TEAM WORLDWIDE CORPORATION,)	
)	
Defendant/Counterclaim-Plaintiff.)	
_____)	

ORDER

It is hereby ORDERED that the Court's Opinion of September 24, 2013, Dkt. No. 208, construing the claims of United States Patent No. 6,793,469 B2, is amended in the following manner:

On page 1, footnote 1, and page 2 of the Opinion, the number "6,703,469" is deleted and replaced with the number "6,793,469".

SO ORDERED.

DATE: March 10, 2014

/s/ _____
PAUL L. FRIEDMAN
United States District Judge

A0081



US006793469B2

(12) **United States Patent**
Chung

(10) **Patent No.:** **US 6,793,469 B2**
(45) **Date of Patent:** **Sep. 21, 2004**

(54) **INFLATABLE PRODUCT EQUIPPED WITH PUMP**

(75) Inventor: **Wang Cheng Chung, Taipei (TW)**

(73) Assignee: **Team Worldwide Corporation, Taipei (TW)**

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/738,331**

(22) Filed: **Dec. 18, 2000**

(65) **Prior Publication Data**

US 2001/0026763 A1 Oct. 4, 2001

Related U.S. Application Data

(63) Continuation-in-part of application No. 09/542,477, filed on Apr. 4, 2000.

(51) **Int. Cl.**⁷ **F04B 17/00; F04B 19/00**

(52) **U.S. Cl.** **417/411; 417/238; 417/423.15**

(58) **Field of Search** 417/239, 238, 417/411, 423.15, 423.11, 423.14; 5/706, 413 AM, 945

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Primary Examiner—Edward K. Look

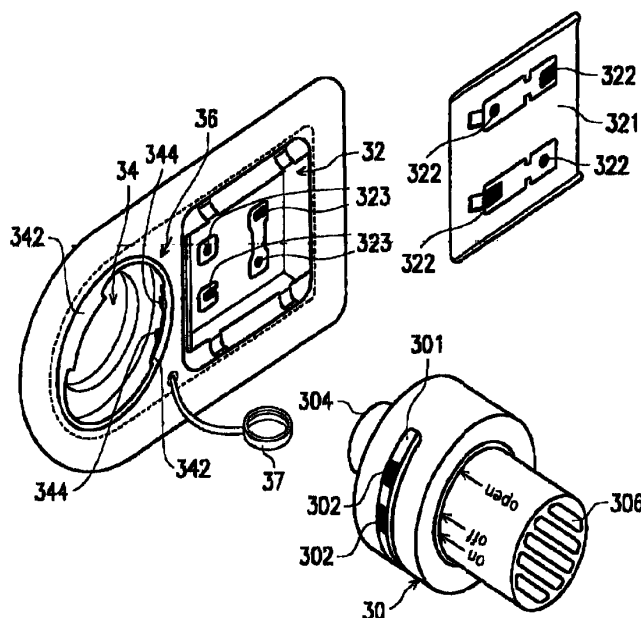
Assistant Examiner—Timothy P. Solak

(74) *Attorney, Agent, or Firm*—Quintero Law Office

(57) **ABSTRACT**

An inflatable product includes an inflatable body, a socket, an electric pump, at least one battery and a connector. The socket is built in the inflatable body. The electric pump is connected to the socket to pump the inflatable body. The battery is disposed in the electric pump. The connector is provided on the electric pump for connecting an external power. The electric pump is supplied with power by the battery or the external power.

17 Claims, 25 Drawing Sheets



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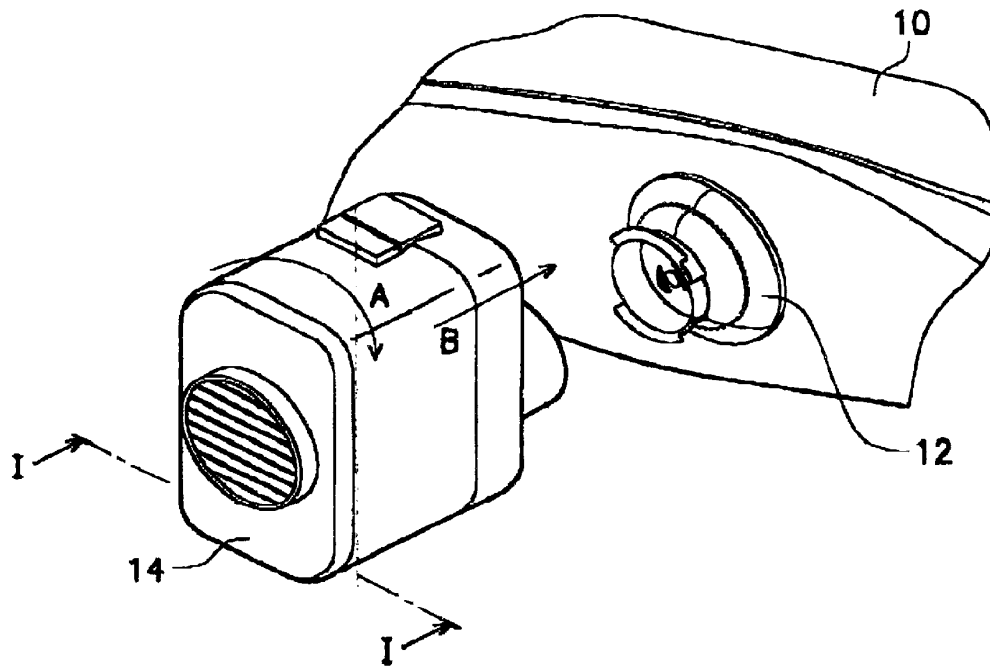


FIG. 1A (PRIOR ART)

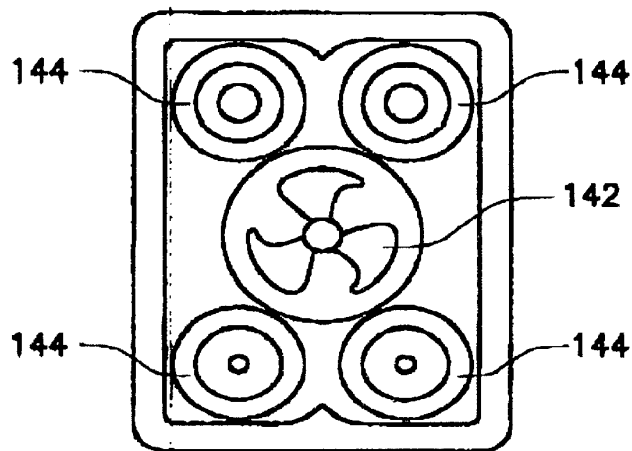


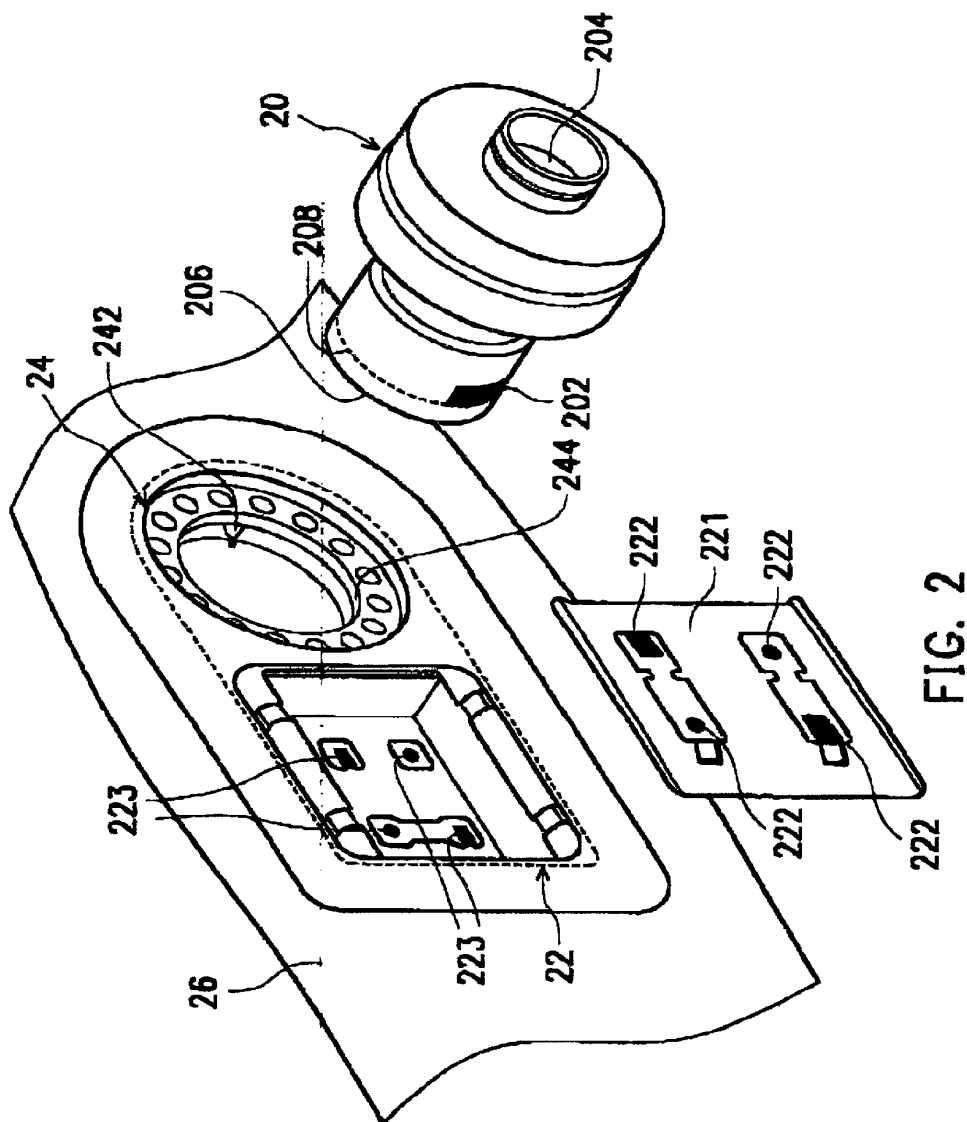
FIG. 1B (PRIOR ART)

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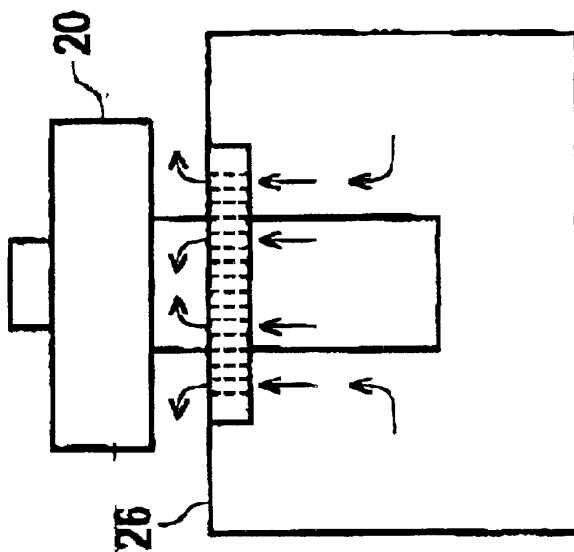


FIG. 3B

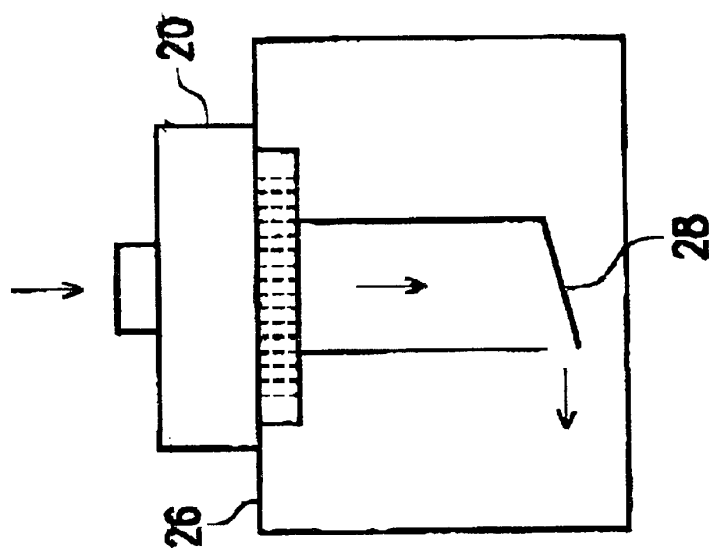


FIG. 3A

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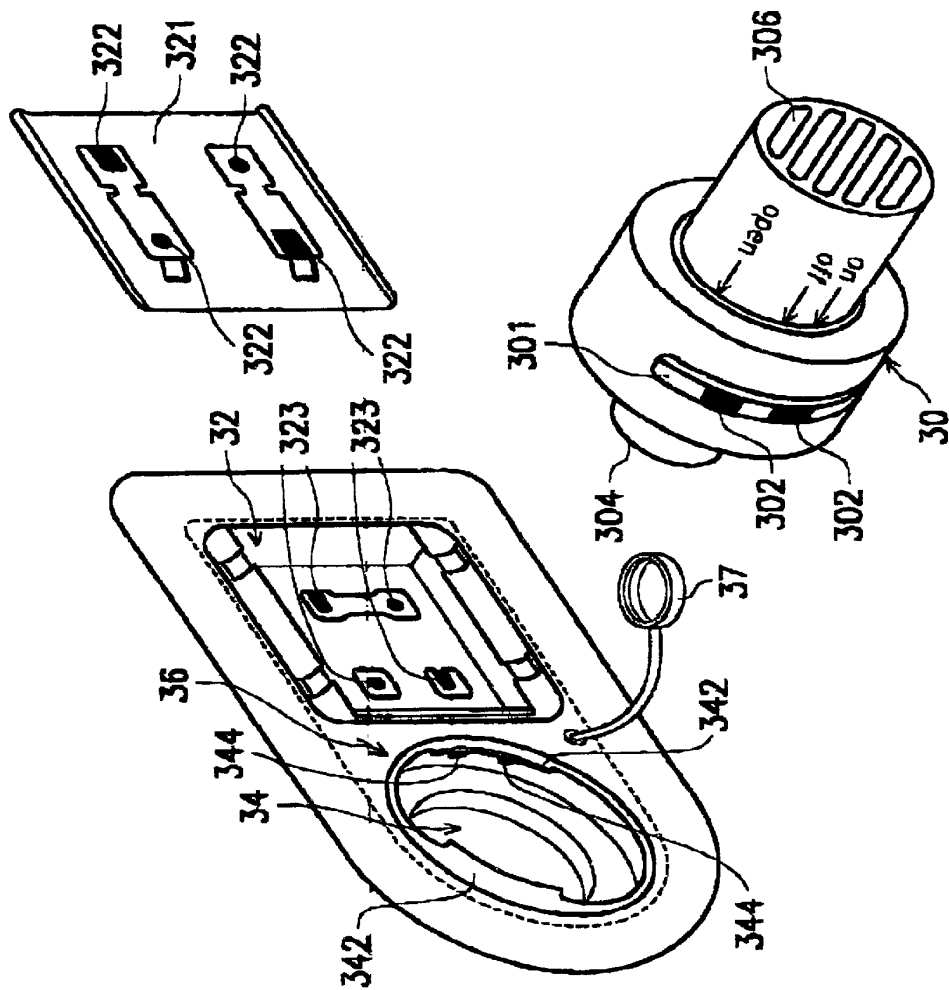


FIG. 4

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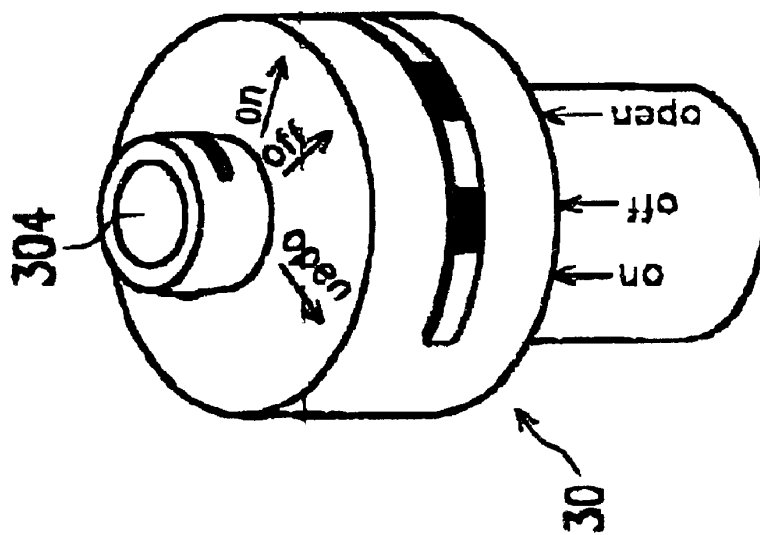


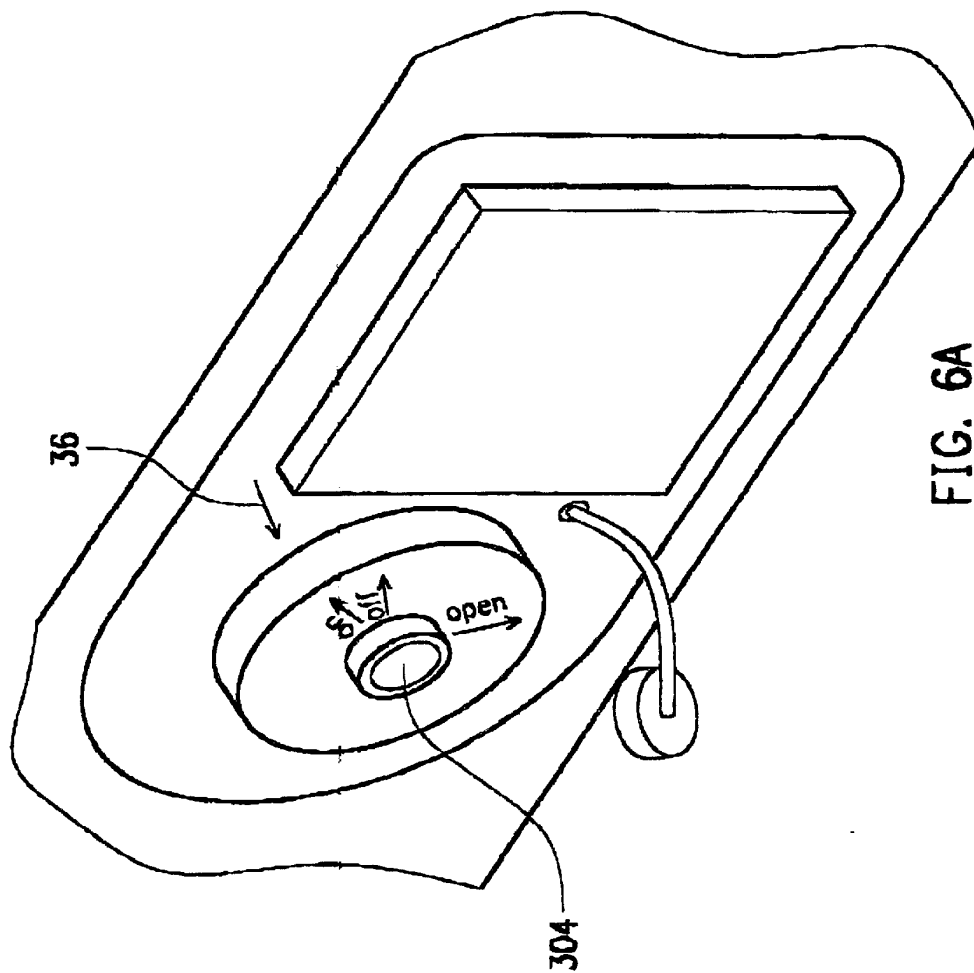
FIG. 5

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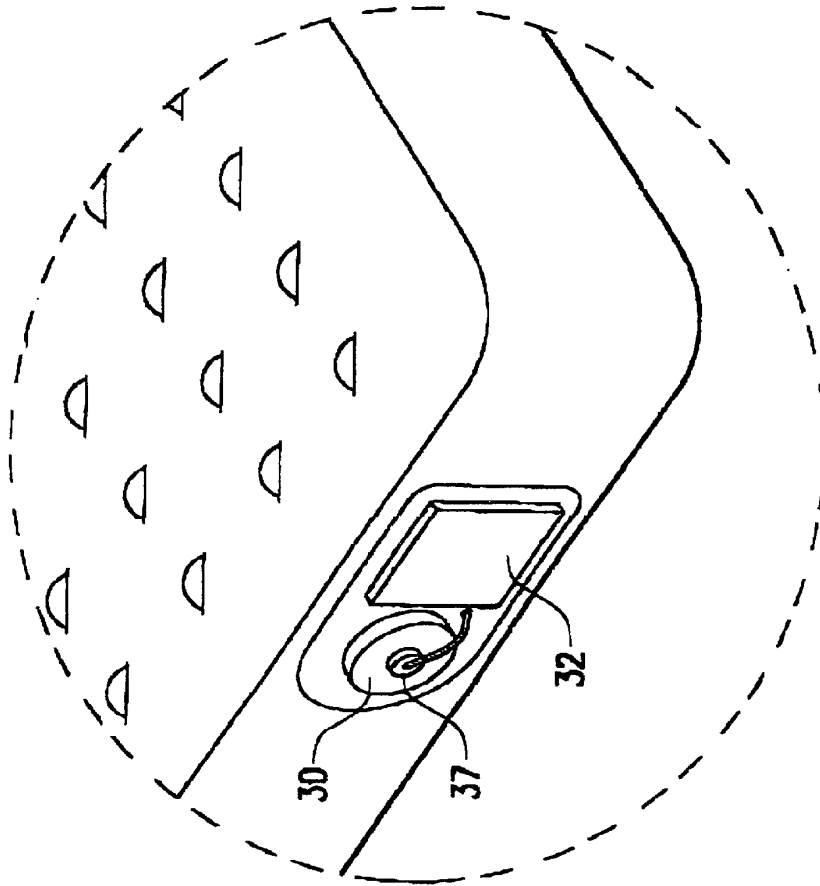


FIG. 6C

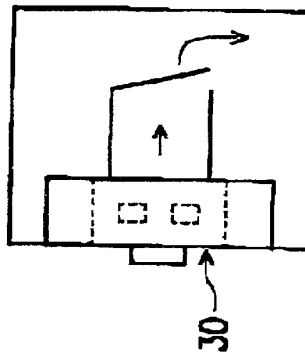


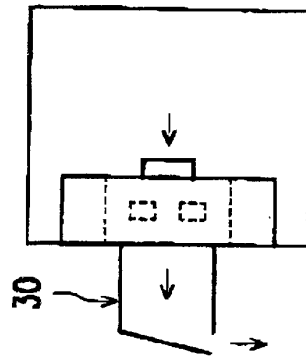
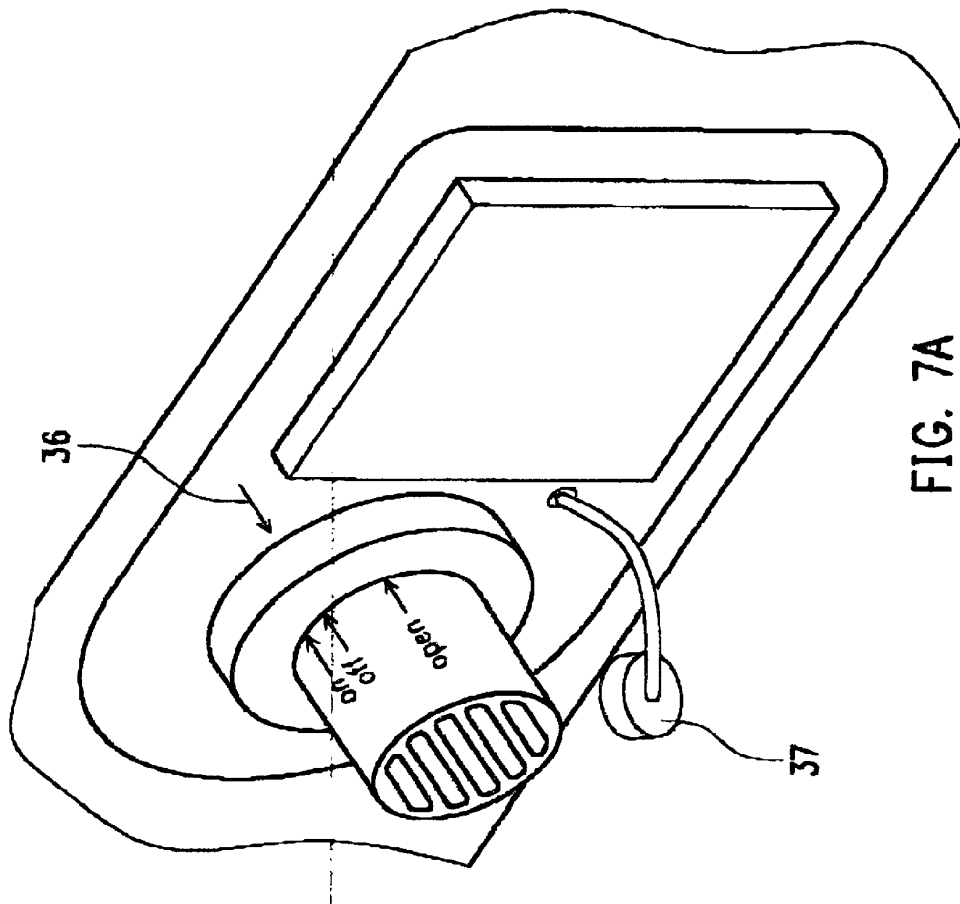
FIG. 6B

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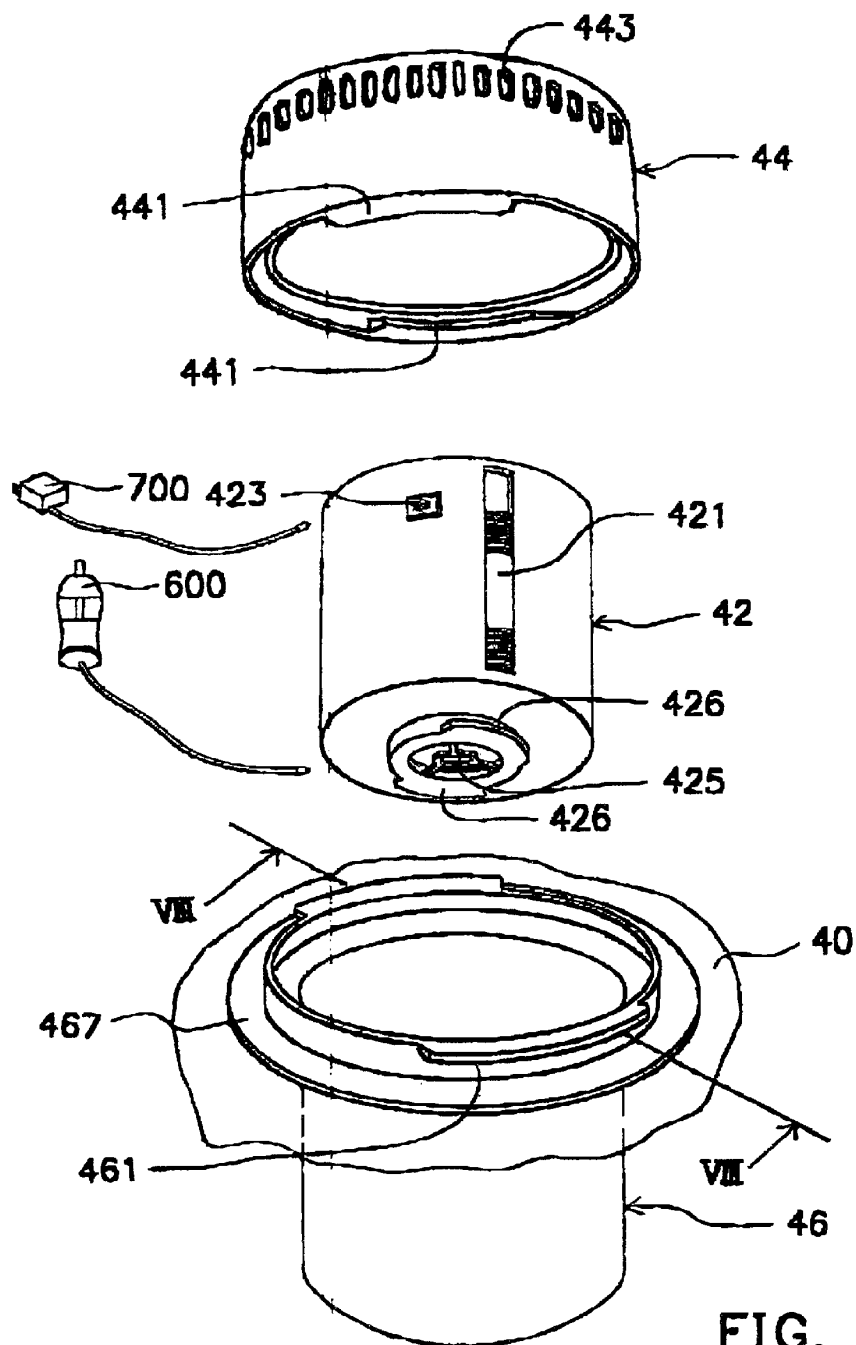


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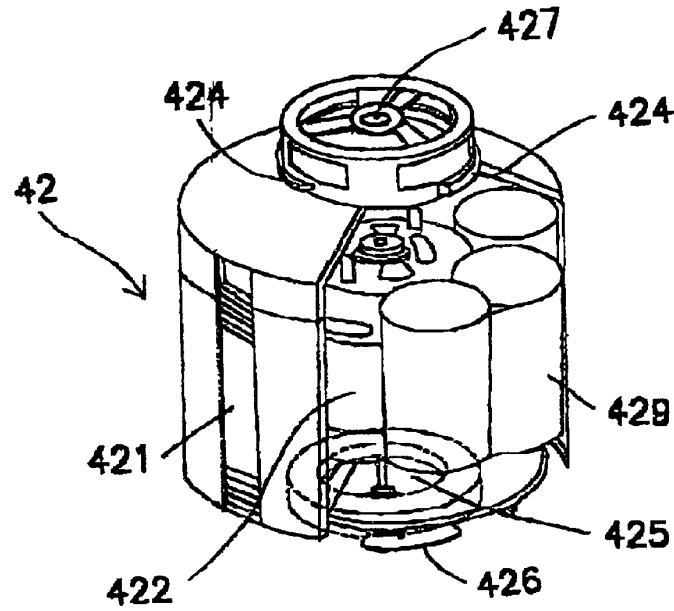


FIG. 8B

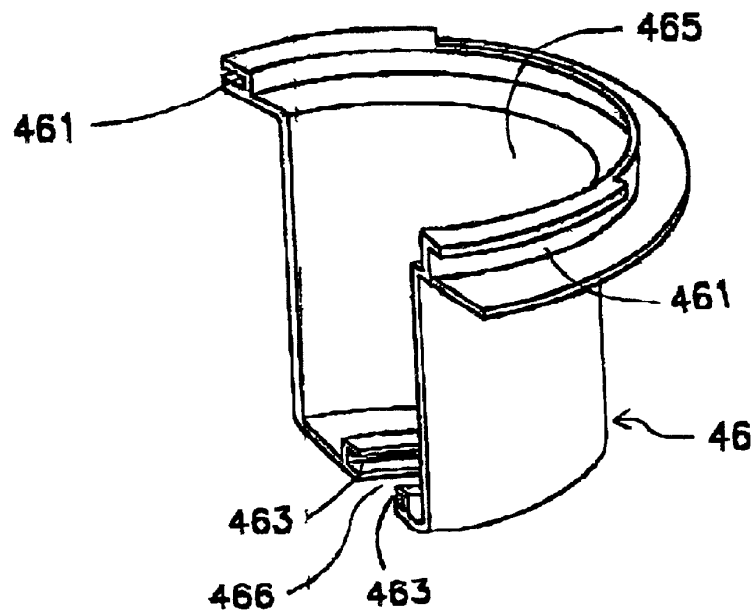


FIG. 8C

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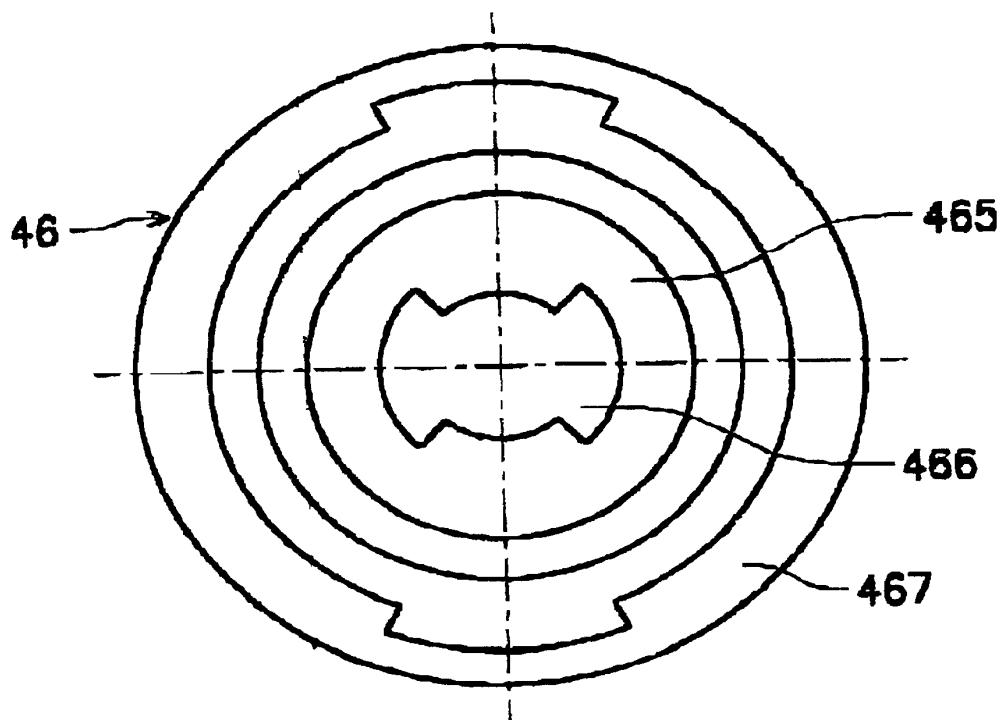


FIG. 8D

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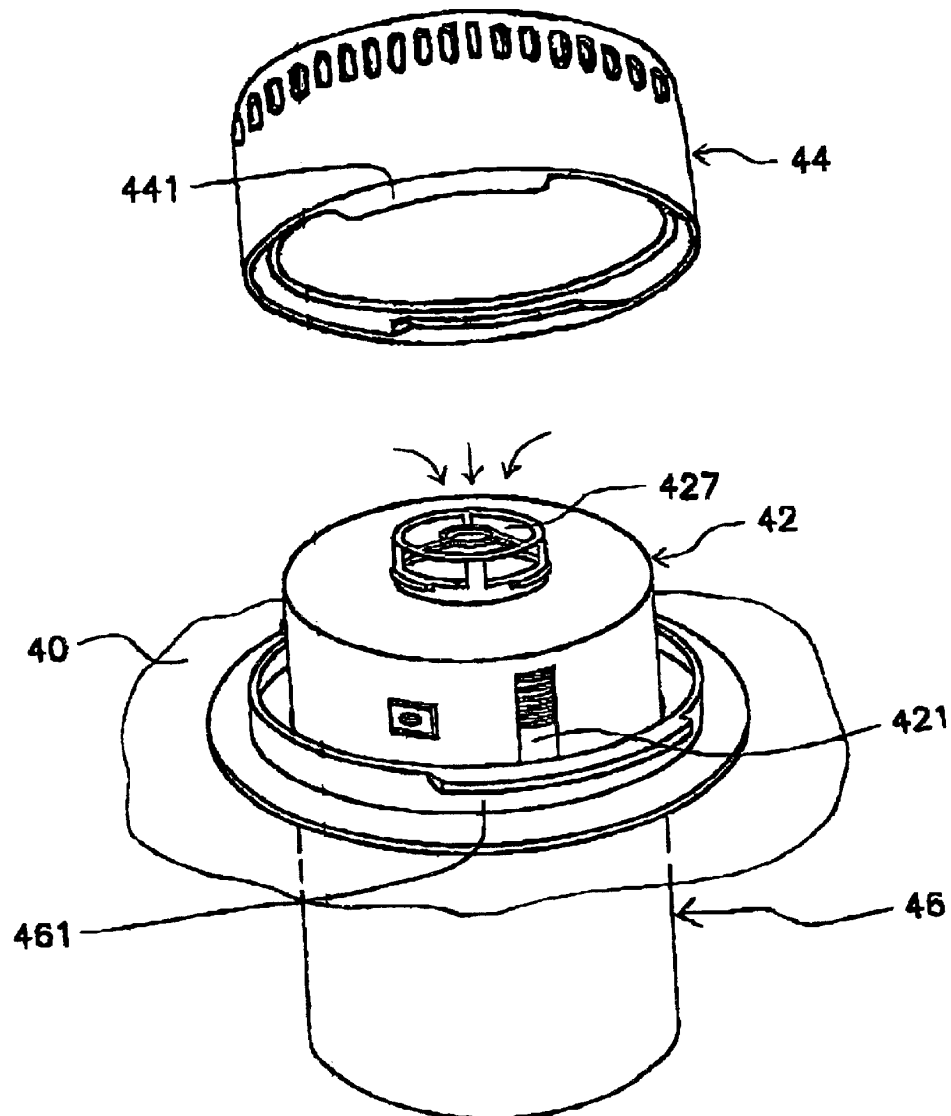


FIG. 8E

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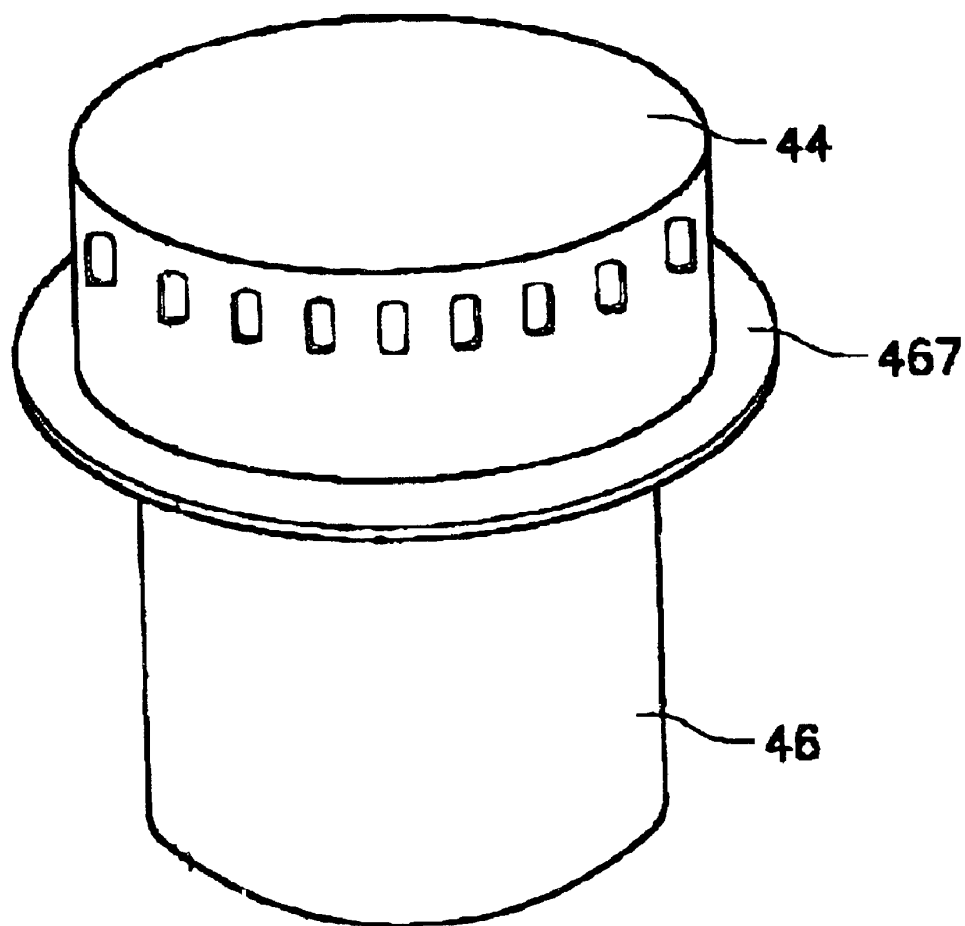


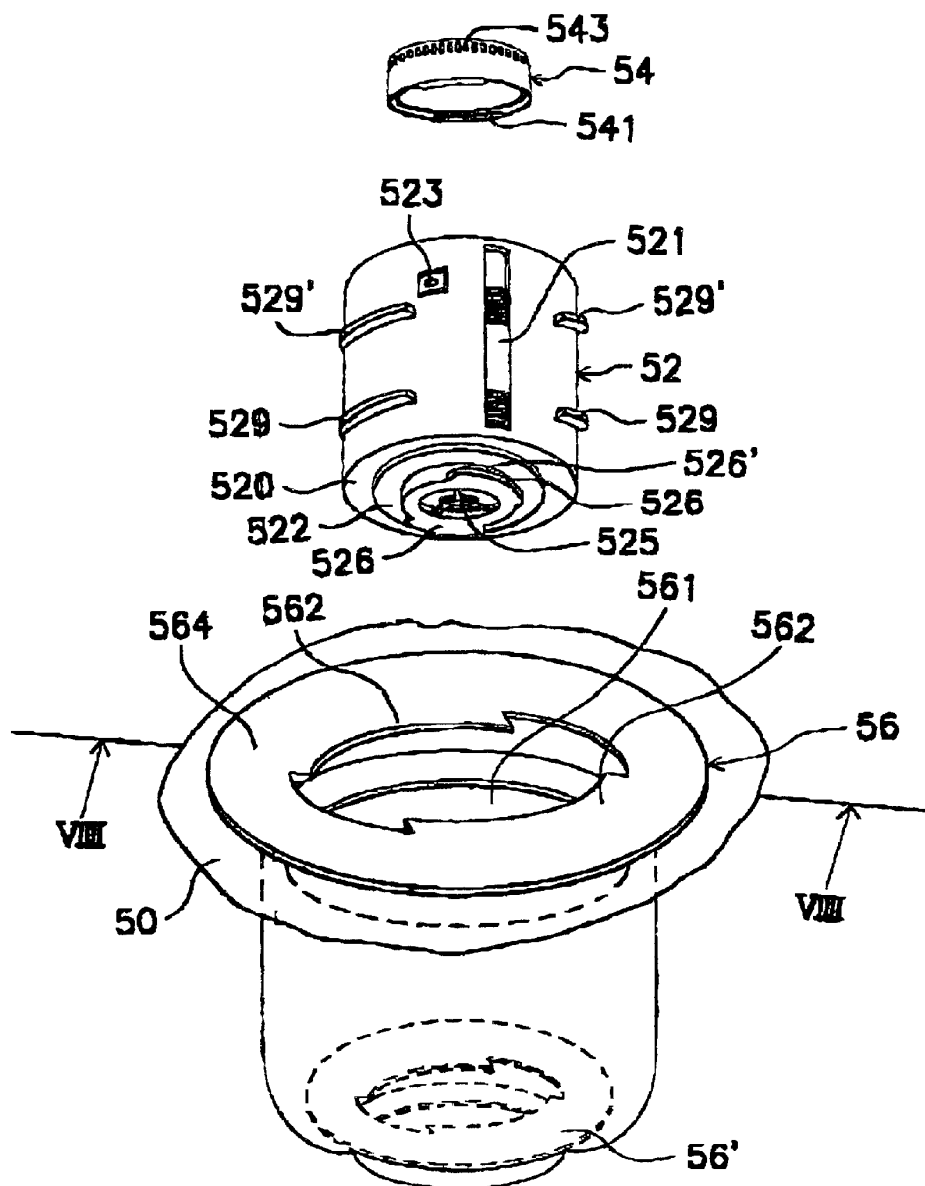
FIG. 8F

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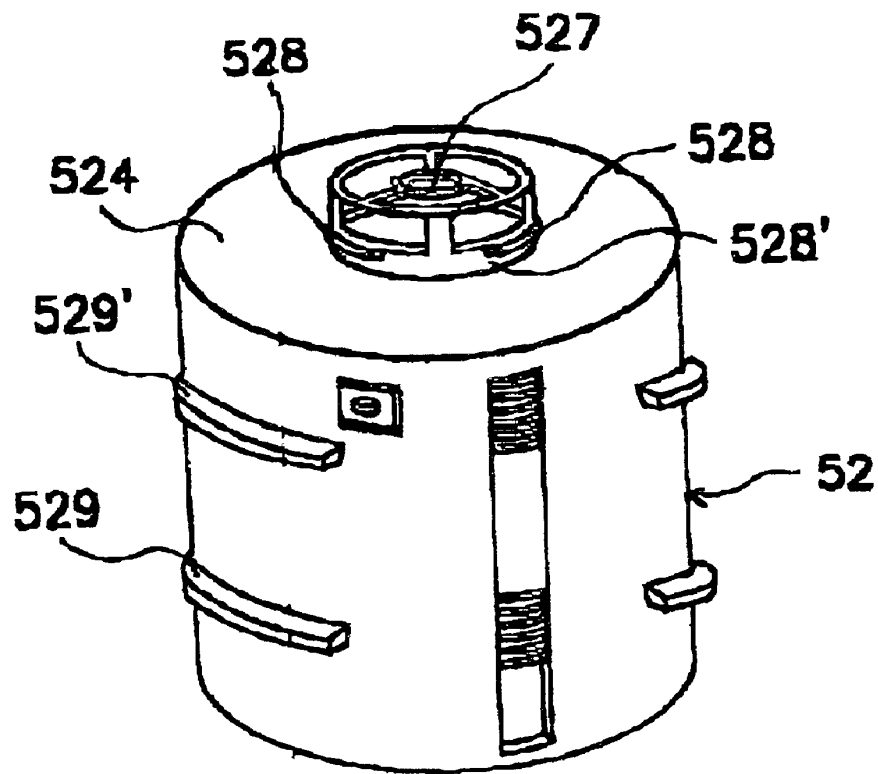


FIG. 9B

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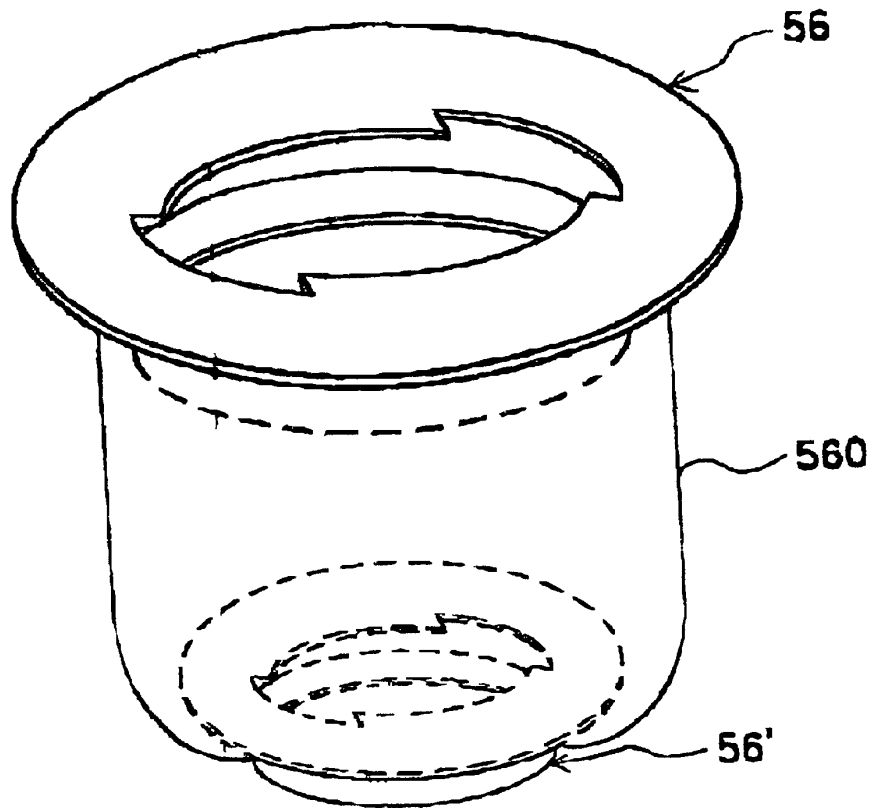


FIG. 9C

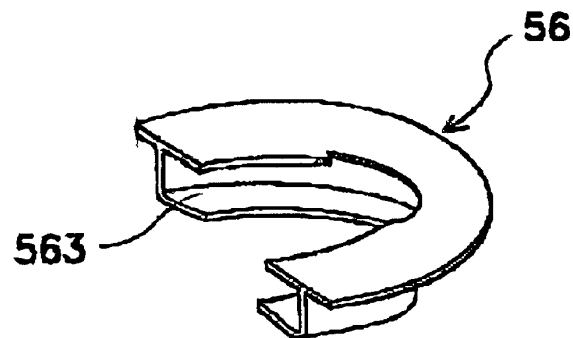


FIG. 9D

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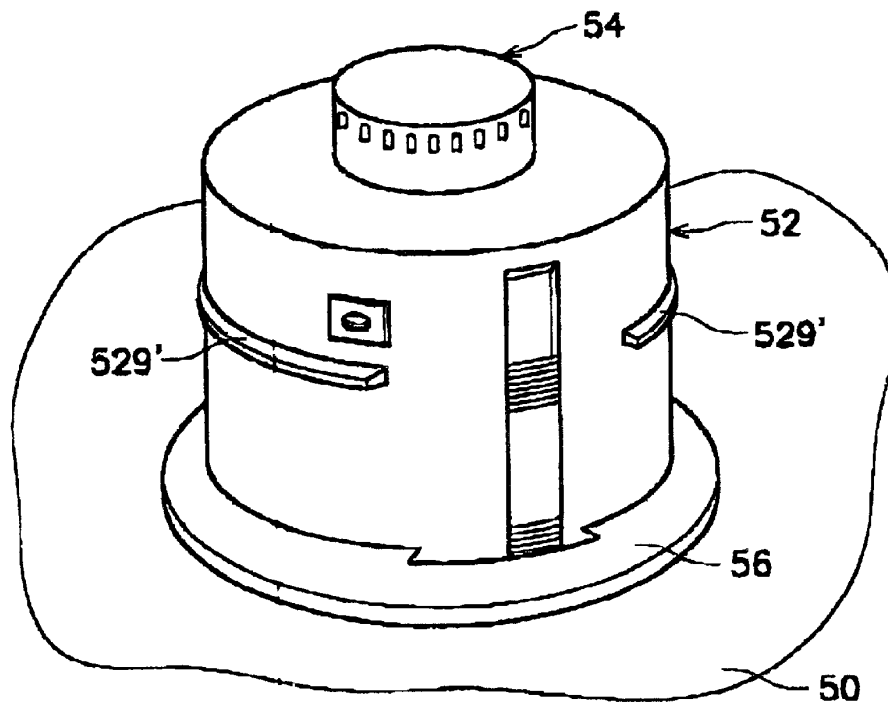


FIG. 9E

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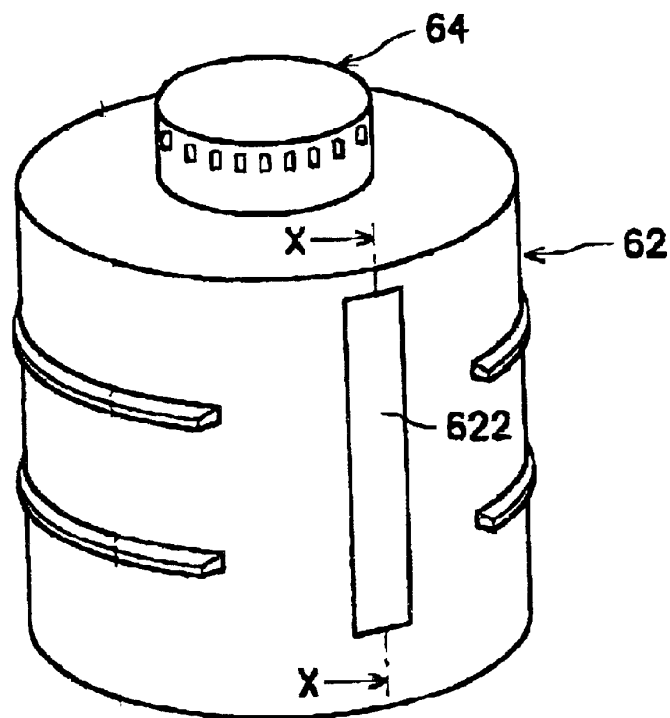


FIG. 10A

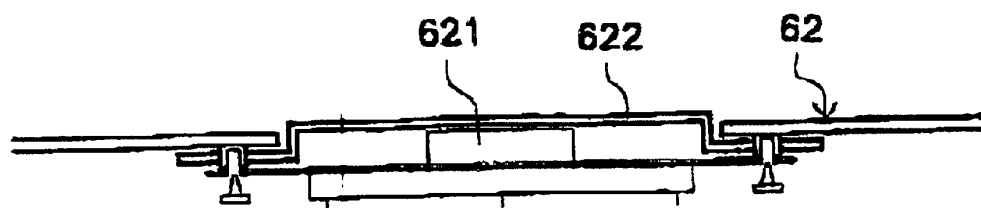


FIG. 10B

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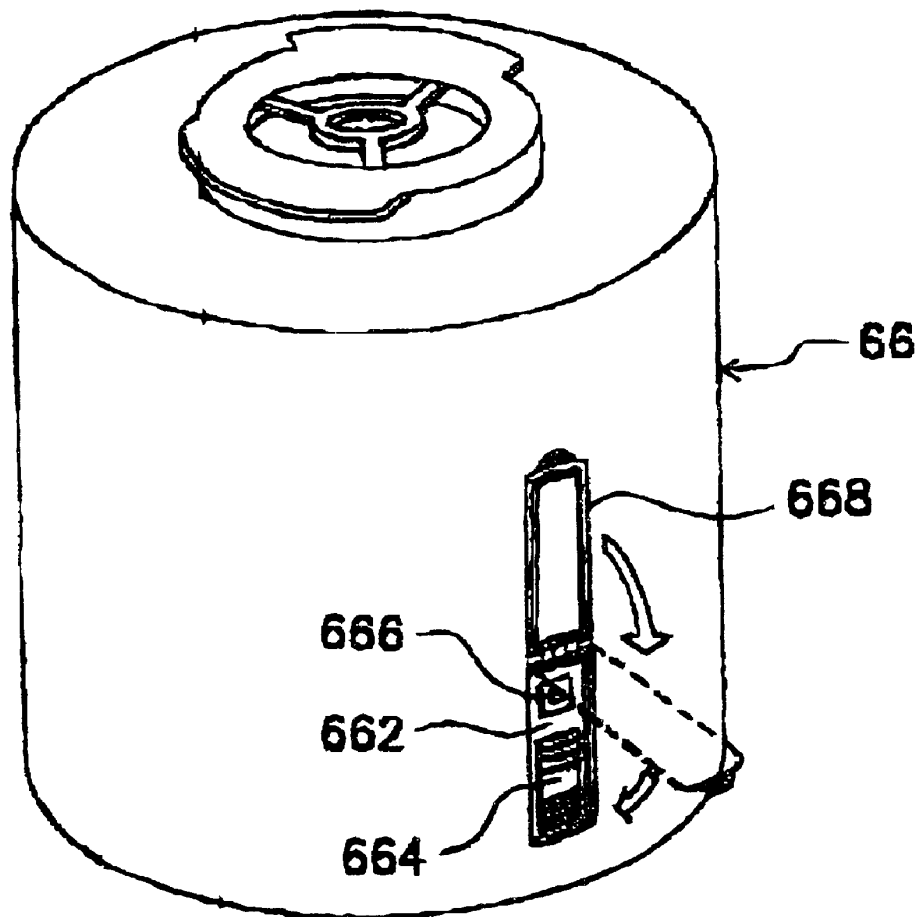


FIG. 11

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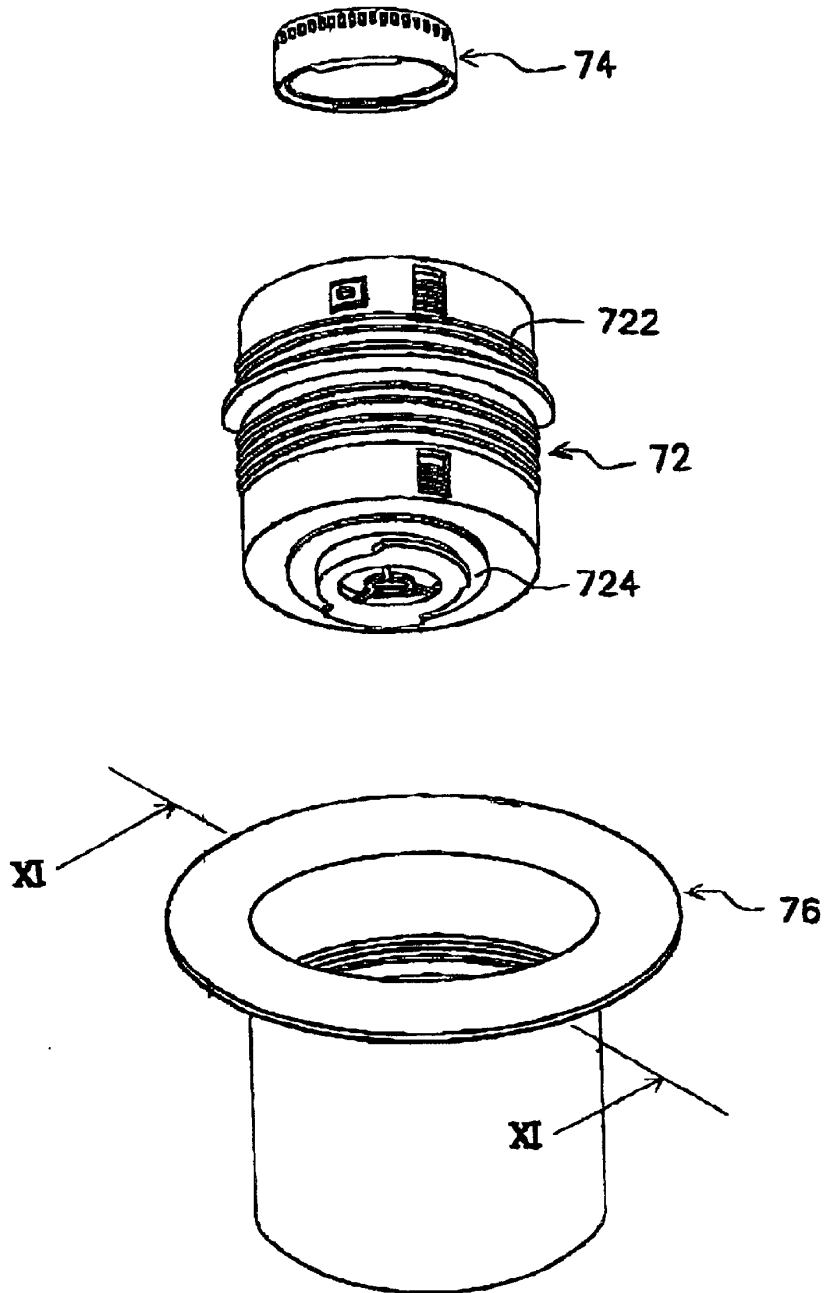


FIG. 12A

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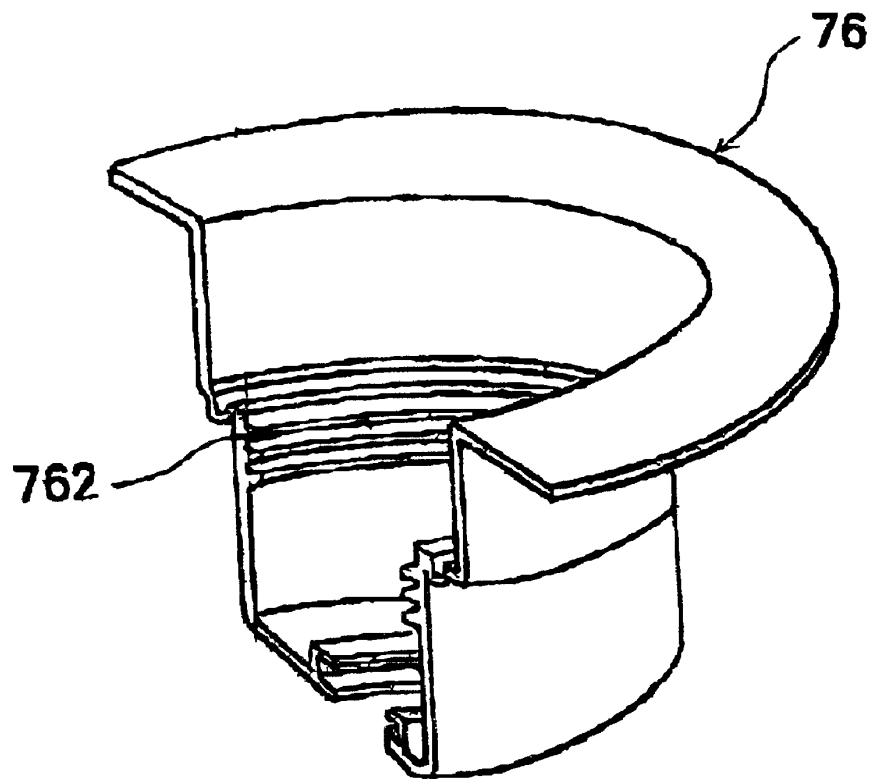


FIG. 12B

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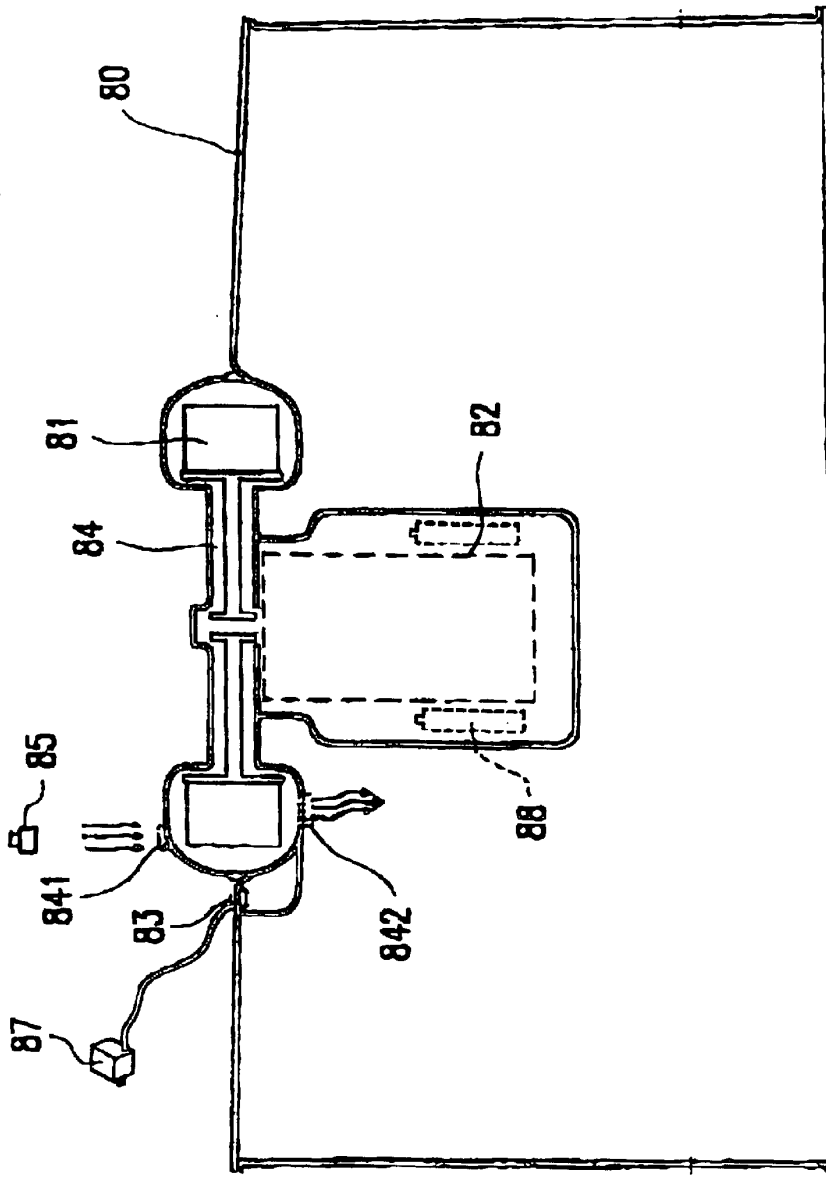


FIG. 13A

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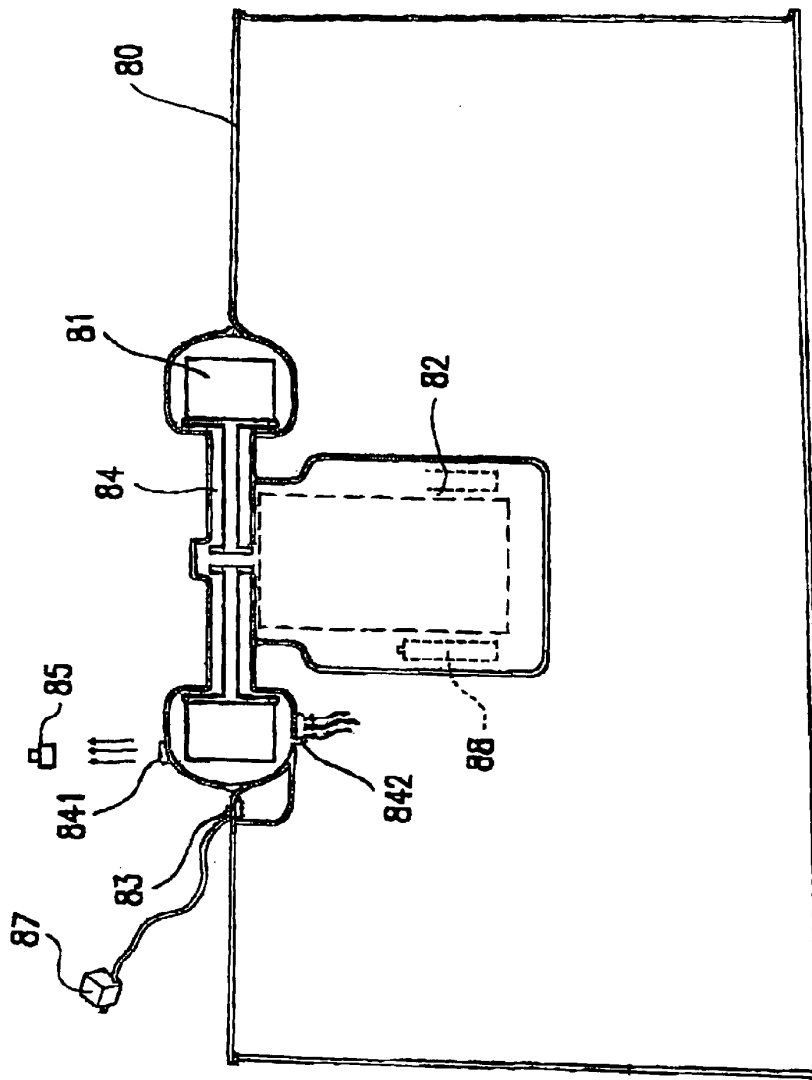


FIG. 13B

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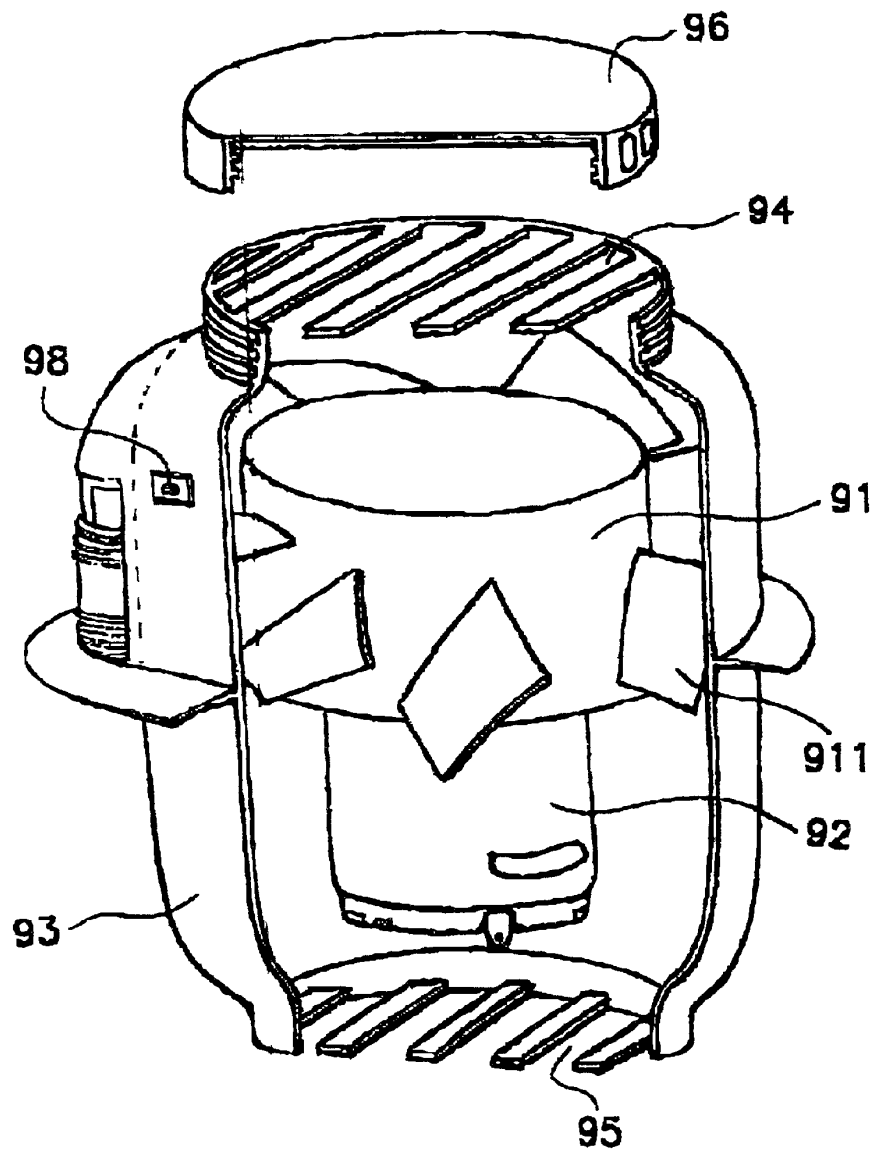


FIG. 14

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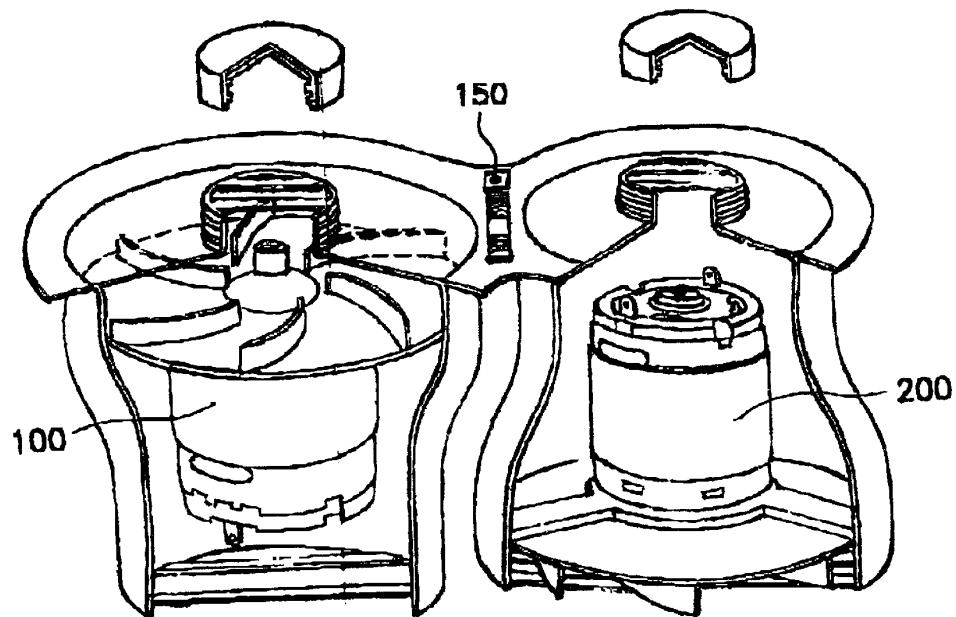


FIG. 15

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INFLATABLE PRODUCT EQUIPPED WITH PUMP**CROSS REFERENCE TO RELATED APPLICATION**

This is a continuation-in-part application of U.S. patent application Ser. No. 09/542,477, filed Apr. 4, 2000.

BACKGROUND OF THE INVENTION**1. Field of the Invention**

The present invention relates in general to an inflatable product provided with a built-in battery case and socket.

2. Description of the Related Art

Referring to FIGS. 1A and 1B, a conventional electric pump **14** for inflating an airbed has a fan and motor **142** inside. A plurality of batteries **144** are loaded into the electric pump **14** to supply the power. The airbed **10** is provided with a valve **12**. In operation, the electric pump **14** is connected to the valve **12** in direction B and then rotated in direction A to fasten the connection between the electric pump **14** and the airbed **10**. Then, the airbed **10** is pumped by the electric pump **14**.

SUMMARY OF THE INVENTION

An object of the present invention is to provide a modified airbed, which is inflated and deflated in a different way from the conventional way mentioned above.

The airbed of the present invention includes an inflatable body, a socket, an electric pump and a battery case. The socket is built in the airbed. The electric pump is detachably connected to the socket to pump the airbed. The battery case is also built into the airbed for ease of loading batteries that supply the electric pump with power.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention can be more fully understood by reading the subsequent detailed description and examples with references made to the accompanying drawings, wherein:

FIG. 1A depicts a conventional airbed;

FIG. 1B is a sectional view along line I—I in FIG. 1A;

FIG. 2 locally depicts an airbed in accordance with a first embodiment of the present invention;

FIG. 3A shows the inflating operation of the airbed of the first embodiment;

FIG. 3B shows the deflating operation of the airbed of the first embodiment;

FIG. 4 locally depicts an airbed in accordance with a second embodiment of the present invention;

FIG. 5 is a perspective diagram of the electric pump of the second embodiment;

FIGS. 6A, 6B and 6C show the inflating operation of the airbed of the second embodiment;

FIGS. 7A and 7B show the deflating operation of the airbed of the second embodiment;

FIG. 8A is an exploded perspective diagram of a local portion of an airbed in accordance with a third embodiment of the present invention;

FIG. 8B is a perspective diagram of the electric pump of the airbed of the third embodiment;

FIG. 8C is a sectional view of a socket of the airbed along line VIII—VIII in FIG. 8A;

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FIG. 8D is a top view of the socket shown in FIG. 8A;

FIG. 8E depicts the electric pump and the socket assembled together in accordance with the third embodiment of the present invention;

FIG. 8F depicts the cover, the electric pump and the socket assembled together in accordance with the third embodiment of the present invention;

FIG. 9A is an exploded perspective diagram of a local portion of an airbed in accordance with a fourth embodiment of the present invention;

FIG. 9B is a perspective diagram of the electric pump of the airbed of the fourth embodiment;

FIG. 9C depicts a set of sockets of the fourth embodiment;

FIG. 9D is a sectional view of a socket of the airbed along line VIII—VIII in FIG. 9A;

FIG. 9E depicts the cover, the electric pump and the socket assembled together in accordance with the fourth embodiment of the present invention;

FIG. 10A is a perspective diagram of a local portion of an airbed in accordance with a fifth embodiment of the present invention;

FIG. 10B is a sectional view of the electric pump along line X—X of FIG. 10A;

FIG. 11 is a perspective diagram of an electric pump of an airbed in accordance with a sixth embodiment of the present invention;

FIG. 12A is a perspective diagram of a cover, electric pump and socket of an airbed in accordance with a seventh embodiment of the present invention;

FIG. 12B is a sectional view of the socket along line XI—XI of FIG. 12A;

FIG. 13A is a schematic diagram of an airbed in an inflating operation in accordance with an eighth embodiment of the present invention;

FIG. 13B is a schematic diagram of the airbed in a deflating operation in accordance with the eighth embodiment of the present invention;

FIG. 14 is a perspective diagram of an electric pump of an airbed in accordance with a ninth embodiment of the present invention;

FIG. 15 is a perspective diagram of an electric pump of an airbed in accordance with a tenth embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. 2, an airbed **26** of a first embodiment of the present invention is provided with a detachable electric pump **20**, a built-in battery case **22** and a built-in socket **24**. The battery case **22** has a cover **221** on which electrodes **222** are provided. Also, on the bottom of the battery case **22** are provided electrodes **223** corresponding to the electrodes **222** of the cover **221**. An O-ring **244** and an electrode **242** are provided on the inner wall of the socket **24**, wherein the electrode **242** is electrically connected to the electrodes **222**, **223** of the battery case **22**. Furthermore, the electric pump **20** is substantially cylindrical and has an electrode **202** on its side surfaces, an air inlet **204** and an air outlet **206** on its ends and a check valve **208** inside. The check valve **208** of the electric pump allows air to flow in a single direction from the inlet **204** to the outlet **206**.

In operation, batteries are loaded into the battery case **22**. The electric pump **20** is fitted into the socket **24** and then rotated so that the electrode **202** of the electric pump **20**

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physically contacts the electrode 242 of the socket 24. Then, the electric pump 20 is actuated to pump outside air into the airbed 26 as shown in FIG. 3A. The O-ring 242 in the socket 24 prevents the airbed 26 from leaking. In deflating operation, the user detaches the electric pump 20 from the socket 24 to deflate the airbed 26, as shown in FIG. 3B.

It is understood that the O-ring can be provided on the side surfaces of the electric pump 20 instead of in the socket 24 to prevent the airbed from leaking.

Referring to FIG. 4, an airbed of a second embodiment of the present invention is provided with a detachable electric pump 30, a cap 37 for the electric pump 30, a built-in battery case 32 and a built-in socket 34. The battery case 32 has a cover 321 on which electrodes 322 are provided. Also, on the bottom of the battery case 32 are provided electrodes 323 corresponding to the electrodes 322 of the cover 321. Furthermore, an arrow symbol 36 is marked on the airbed and besides the socket 34. Flanges 342 are formed at the rim of the socket 34, while electrodes 344 are provided on the inner wall of the socket 34 and are electrically connected to the electrodes 322, 323 of the battery case 32. Furthermore, the electric pump 30 is substantially cylindrical and has a flange 301 on its side surfaces, two electrodes 302 provided on the flange 301, an air inlet 304 and an air outlet 306 on its ends. Also referring to FIG. 5, symbols "on", "off" and "open" are marked on the side surfaces and the end of the electric pump 30.

In operation, batteries are loaded into the battery case 32 to supply the electric pump 30 with the power. The electric pump 30 in this embodiment is used to inflate or deflate the airbed. In inflating operation, the electric pump 30 is fitted into the socket 34 with the air outlet 306 inside the airbed and the air inlet 304 outside the airbed. The electric pump 30 is rotated to change the positions of symbols "on", "off" and "open". When the arrow symbol 36 points at the symbol "on" as shown in FIG. 6A, the electrodes 302 of the electric pump 30 physically contact the electrodes 344 of the socket 34 to actuate the electric pump 30. Then, outside air is pumped into the airbed as shown in FIG. 6B. When the arrow symbol 36 points at the symbol "off", the electric pump 30 is stopped. When the arrow symbol 36 points at the symbol "open", the electric pump 30 is detachable from the socket 34. FIG. 6C depicts the airbed full of air, wherein the air outlet of the electric pump 30 is closed by the cap 37 to seal the airbed after the inflating operation.

In the deflating operation, the electric pump 30 is fitted in reverse into the socket 34, with the air inlet 304 inside the airbed and the air outlet 306 outside the airbed. The electric pump 30 is rotated to change the positions of symbols "on", "off" and "open" on its side surfaces. When the arrow symbol 36 points at the symbol "on" as shown in FIG. 7A, the electrodes 302 of the electric pump 30 physically contact the electrodes 344 of the socket 34 to actuate the electric pump 30. Then, air inside the airbed is pumped out as shown in FIG. 7B. When the arrow symbol 36 points at the symbol "off", the electric pump 30 is stopped. When the arrow symbol 36 points at the symbol "open", the electric pump 30 is detachable from the socket 34.

In either of the inflating and deflating operations, the flanges 342 of the socket 34 are used for confining the flange 301 of the electric pump 30, thus preventing the electric pump 30 from separating with the socket 34 when the arrow symbol 36 points at the symbols "on" and "off". However, the flanges 342 are spaced apart at the rim of the socket 34 to avoid confining the flange 301 of the electric pump 30 when the arrow symbol 36 points at the symbol "open".

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Thus, the electric pump 30 is detachable from the socket 34 when the arrow symbol 36 points at the symbol "open".

Referring to FIG. 8A, an airbed of the third embodiment of the present invention is provided with a cover 44, an electric pump 42 and a built-in socket 46. The cover 44 is circular, with a plurality of recesses 443 provided on its side surfaces. Such an arrangement increases the friction on the side surfaces, facilitates the rotation of the cover 44. Furthermore, the cover 44 is closed at its top end and is opened at its bottom end. At the bottom end of the cover 44 is provided a pair of inward arcuate flanges 441. The arcuate flanges 441 extend to the bottom rim of the cover 44 to engage the socket 46 mounted on the body 40 of the airbed. The electric pump 42 is cylindrical. On the side surfaces of the electric pump is provided a switch 421 and a connector 423. Also referring to FIG. 8B, a plurality of rechargeable batteries 429 are provided in the electric pump 42 to supply the motor 422 with power. The connector 423 is used for connecting an external power (alternating current or direct current) to charge the batteries 429 or directly to actuate the electric pump 42. For example, the connector 523 is connected to a cigarette lighter (direct current) of a car via a cigarette plug 600. Alternatively, the connector 423 is connected to a alternating current power supply via a rectifier 700 which converts the alternating current into a direct current for the electric pump. Furthermore, at the ends of the electric pump 42 are provided a protruding air inlet 427 and a protruding air outlet 425. Outward flanges 424, 426 are respectively provided at the air inlet 427 and air outlet 425. The socket 46 is a cylindrical housing, while an annular flange 467 is provided on the side surfaces of the socket 46 to define an upper portion and a lower portion of the socket 46. The annular flange 467 is welded together with the body 40 of the airbed so that the lower portion of the socket 46 is buried in the airbed. Referring to FIG. 8C, the socket 46 has a large hole 465 at its top end and a small hole at its bottom end. The large hole 465 at the top end is circular. The small hole 466 at the bottom end is shown in FIG. 8D, the shape of which matches those of the air inlet 427 and air outlet 425 of the electric pump 42. Furthermore, the socket 46 has grooves 461 formed on the outer surface of the upper portion and other grooves 463 formed at the inner circumferences of the hole 466 at the bottom end.

In the inflating operation, the electric pump 42 is put in the socket 46, with the air outlet 425 of the electric pump 42 aligning with the bottom hole 466 of the socket 46. Then, the electric pump 42 is rotated so that the flanges 426 of the electric pump 42 enter the grooves 463 at the bottom end of the socket 46. Thus, the electric pump 42 and the socket 46 are firmly connected together, as shown in FIG. 8E. The user pushes the switch 421 of the electric pump 42 to pump outside air into the body 40 of the airbed. The air flows from the air inlet 427, through the air outlet 425 and bottom hole 466, to the inside of the airbed.

If the airbed is used on the water, then the cover 44 is necessarily assembled together with the socket 46. The user rotates the cover 44 so that the inner flanges 441 enter the grooves 461 of the socket 46. Thus, the cover 44 and the socket 46 are firmly connected together. The cover 44 protects the electric pump 42 from water.

In the deflating operation, the electric pump 42 is fitted in reverse into the socket 46, with the air inlet 427 of the electric pump 42 aligning with the bottom hole 466 of the socket 46. Then, the electric pump 42 pumps air inside the airbed out.

Referring to FIG. 9A, an airbed of the fourth embodiment of the present invention is provided with a cover 54, an

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electric pump 52 and a set of sockets 56, 56' built in the body of the airbed. The cover 54 is circular, with a plurality of recesses 543 provided on its side surfaces. Such an arrangement increases the friction on the side surfaces, facilitates the user to rotate the cover 54. Furthermore, the cover 54 is closed as its top end and is opened at its bottom end. At the bottom end of the cover 54 is provided a pair of inward arcuate flanges 541. The arcuate flanges 541 extend to the rim of the bottom end of the cover 54 for engaging the socket 56. The electric pump 52 is cylindrical. On the side surfaces of the electric pump 52 are provided a switch 521, an connector 523 and circumferential flanges 529, 529'. Furthermore, a plurality of rechargeable batteries (not shown) are provided in the electric pump 52 to supply the power. The connector 523 is used for connecting an external power to charge the batteries or directly to actuate the electric pump 52. Referring to both FIGS. 9A and 9B, at the ends 524, 520 of the electric pump 52 are provided a protruding air inlet 527 and a protruding air outlet 525. A pair of outward flanges 528 are provided at the air inlet 527, with grooves 528' formed between the flanges 528 and the end 524. Another pair of outward flanges 526 are provided at the air outlet 525 to form grooves 526' between the flanges 526 and the end 520. Referring to FIG. 9C, the set of sockets include a top socket 56 and a bottom socket 56' connected by a flexible sleeve 560. The top socket 56 is welded together with the body 50 of the airbed. The top and bottom sockets 56, 56' have the same structure and therefore only the top socket 56 is now introduced. The top socket 56 has a top surface 564 with a through hole 561 provided on the top surface 564. Furthermore, the top socket 56 has a pair of inward flanges 562 protruding from the top surface 564 toward the through hole 561. Referring to FIG. 9D, an annular groove 563 is formed in the socket 56.

In the inflating operation, the electric pump 52 is inserted into the set of sockets 56, 56' on the airbed 50. The protruding air outlet 525 of the electric pump 52 is fitted into the bottom socket 56'. The rubber pad 522 eliminates any gaps between the bottom sockets 56' and the electric pump 52 through which the airbed possibly leaks. The circumferential flanges 529 of the electric pump 52 enter the groove 563 of the socket 56. Then, the electric pump 52 is rotated so that the flanges 529 of the electric pump 52 are confined in the grooves 563 by the flanges 562 of the top socket 56. Then, the user pushes the switch 521 on the electric pump 52 to pump the airbed. After the airbed is filled with air, the user assembles the cover 54 and the electric pump 52 as shown in FIG. 9E, with the flanges 541 of the cover 54 received in the grooves 528' of the electric pump 52. The cover 54 prevents the airbed from leaking though the air inlet 527.

In the deflating operation, the electric pump 52 is reversely disposed with the air inlet 527 connected to the bottom socket 56'. Also, the flanges 528 of the electric pump 52 are confined in the grooves 563 by the flanges 562 of the top socket 56. Then, the user pushes the switch 521 on the electric pump 52 to pump air in the airbed out. It is noted that the electric pump 52 is not protected from water. Nevertheless, the electric pump 52 can be modified to be waterproof, introduced in the following fifth embodiment.

Refer to FIGS. 10A and 10B. Reference numeral 64 is a cover and reference numeral 62 is a waterproof electric pump. The waterproof electric pump 62 of the fifth embodiment is similar with the electric pump 52 of the fourth embodiment except that (1) the waterproof electric pump 62 has no connector on its side surfaces; (2) the switch 621 of the waterproof electric pump 62 is covered by a waterproof

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rubber strip 622. The waterproof rubber strip 622 is so thin that the user can still push the switch 621 from outside the rubber strip 622 to actuate the electric pump 62.

FIG. 11 depicts another waterproof electric pump 66 in accordance with a sixth embodiment of the present invention, wherein a recess 662 is provided on the side surfaces of the electric pump 66. A switch 664 and a connector 666 are provided in the recess 662, while a lid 668 is rotatably mounted on the side surfaces of the electric pump 66 to protect the switch 664 and the connector 666 from water.

Referring to FIGS. 12A and 12B, an airbed of a seventh embodiment of the invention is provided with a socket 76, an electric pump 72 and a cover 74. The socket 76 has threads 762 on its inner surfaces, while the electric pump 72 has threads 722 on its outer surfaces so that the electric pump 72 and the socket 76 can be screwed together. Furthermore, the electric pump 72 has rubber pads 724 on both ends. The arrangement of rubber pads 724 eliminates any gaps between the socket 76 and the electric pump 72 through which the airbed possibly leaks, when the electric pump 72 and the socket 76 are screwed together. Furthermore, it is noted that the cover 74 is mounted on the electric pump 72 rather than the socket 76 to prevent an air leakage.

Referring to FIG. 13A, an airbed 80 of an eighth embodiment of the invention is provided a cover 85, a chamber 84, a fan 81 received in the chamber 84, a motor 82 for rotating the fan 81, a plurality of rechargeable batteries 88 for supplying the motor 82 with power, and a switch 83 for actuating the motor 82. The motor 82 is also connected to an external power to charge the batteries 88 or directly to actuate the motor 82. The external power supplies an alternating current via a rectifier 87 or supplies a direct current via a cigarette plug (not shown). The chamber 84 has a nozzle 841 communicating the chamber 84 and the outside of the airbed 80, and a hole communicating the chamber 84 and the inside of the airbed 80. In the inflating operation, the user pushes the switch 83 to actuate the motor 82 and fan 81. Then, outside air is pumped into the airbed 80 through the nozzle 841 and the hole 842. After the airbed 80 is filled with air, the user closes the nozzle with the cover 85 to prevent the airbed from leaking. Referring to FIG. 13B, in the deflating operation, the user takes away the cover 85 and pushes the switch 83 to rotate the motor 82 and fan 81 in reverse. Then, air inside the airbed 80 is pumped out.

In the eighth embodiment, the fan 81 is received in a chamber 84 and is driven by an outside motor 82. However, it is understood that the fan and motor can be housed together to operate. Referring to FIG. 14, in a ninth embodiment of the present invention, a motor 92 and a fan 91 with helical blades 911 are assembled and are received in a housing 93. The motor 92 is actuated by rechargeable batteries (not shown) or by an external power (not shown) via a connector 98, wherein the external power supplies an alternating current or a direct current. The housing 93 is mounted on the airbed (not shown) and has a first hole 94 communicating the outside of the airbed and a second hole communicating the inside. In the inflating operation, the fan 91 and motor 92 pump outside air into the airbed through the holes 94, 95. When the airbed is filled with air, the cover 96 is screwed to the housing 93 to prevent an air leakage. In the deflating operation, the cover 96 is taken away. The fan 91 is rotated by the motor 92 in reverse to pump air inside the airbed out.

Referring to FIG. 15, in a tenth embodiment of the present invention, a first fan and motor 100 and a second fan and

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motor **200** are housed in different chambers. The first and second fans and motors **100, 200** are permanently or detachably connected to the airbed (not shown). Furthermore, the motors **100** and **200** are actuated by rechargeable batteries (not shown) or by an external power (not shown) via a connector **150**. In the inflating operation, the first fan and motor **100** is actuated to pump the airbed (not shown) while the second fan and motor **200** is at rest. In the deflating operation, the first fan and motor **100** is at rest while the second fan and motor **200** is actuated to pump air inside the airbed out.

In conclusion, the invention provides various ways to pump an airbed or other inflatable products.

While the invention has been described by way of example and in terms of the preferred embodiment, it is to be understood that the invention is not limited to the disclosed embodiments. To the contrary, it is intended to cover various modifications and similar arrangements as would be apparent to those skilled in the art. Therefore, the scope of the appended claims should be accorded the broadest interpretation so as to encompass all such modifications and similar arrangements.

What is claimed is:

1. An inflatable product including:

an inflatable body;

a socket built in the inflatable body;

an electric pump, including a pump body and an air outlet, connected to the socket to pump the inflatable body, wherein the pump body is wholly or partially located in the socket;

at least one battery disposed in the electric pump; and

a connector provided on the electric pump for connecting an external power, whereby the electric pump is actuated by the at least one battery or the external power.

2. An inflatable product as claimed in claim 1, wherein the at least one battery is rechargeable and is electrically connected to the connector so that the at least one battery can be charged by the external power via the connector.

3. An inflatable product as claimed in claim 1, wherein the external power supplies an alternating current.

4. An inflatable product as claimed in claim 1, wherein the external power supplies a direct current.

5. An inflatable product as claimed in claim 1, further including a cover assembled with the socket to entirely cover the electric pump, thereby protecting the electric pump from water.

6. An inflatable product as claimed in claim 1, further including a cover assembled with the electric pump to prevent the inflatable product from leaking through the electric pump.

7. An inflatable product as claimed in claim 1, wherein the electric pump has first threads and the socket has second threads, by which the electric pump and the socket are screwed together.

8. An inflatable product as claimed in claim 7, wherein the electric pump further has a pad to eliminate gaps between the electric pump and the socket when the electric pump and socket are screwed together.

9. An inflatable product as claimed in claim 1, wherein the electric pump has a lid covering the connector for protecting the connector from water.

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10. An inflatable product as claimed in claim 9, further including a switch provided on the electric pump to actuate the electric pump, and the lid also covers the switch.

11. The inflatable product as claimed in claim 1, wherein the pump body can be received partially or wholly in the socket in a first direction for inflating the inflatable body, and received in a second direction for deflating the inflatable body.

12. An inflatable product including:

an inflatable body;

a socket built in the inflatable body;

an electric pump, including a pump body and an air outlet, connected to the socket to pump the inflatable body, wherein the pump body is wholly or partially located in the socket;

at least one battery disposed in the electric pump to supply the electric pump with power;

a switch provided on the electric pump to actuate the electric pump;

a waterproof layer covering the switch to protect the switch from water.

13. The inflatable product as claimed in claim 12, wherein the pump body can be received partially or wholly in the socket in a first direction for inflating the inflatable body, and received in a second direction for deflating the inflatable body.

14. An inflatable product including:

an inflatable body;

a socket built in the inflatable body;

an electric pump, including a pump body and an air outlet, connected to the socket to pump the inflatable body, wherein the pump body is wholly or partially located in the socket;

a connector provided on the electric pump for connecting an external power to actuate the electric pump.

15. The inflatable product as claimed in claim 14, wherein the pump body can be received partially or wholly in the socket in a first direction for inflating the inflatable body, and received in a second direction for deflating the inflatable body.

16. An inflatable product including:

an inflatable body;

a socket built in the inflatable body;

an electric pump, including a pump body and an air outlet, connected to the socket to pump the inflatable body, wherein the pump body is wholly or partially located in the socket, a portion of the electric pump is inserted into the socket, and the portion of the electric pump and the socket are matched with each other to prevent an air leakage therebetween.

17. The inflatable product as claimed in claim 16, wherein the pump body can be received partially or wholly in the socket in a first direction for inflating the inflatable body, and received in a second direction for deflating the inflatable body.

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